JUN 13 1938

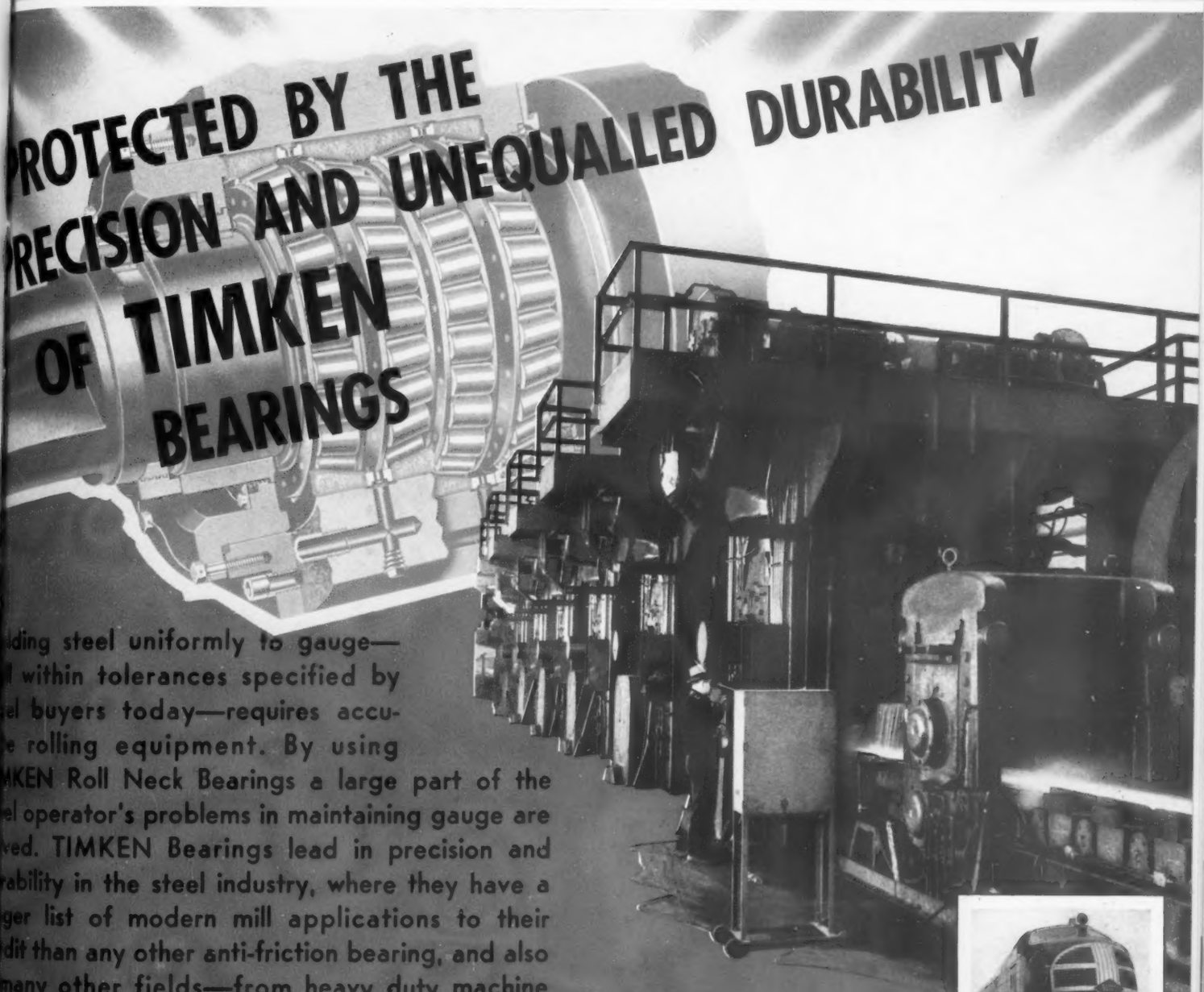
June 13, 1938

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

PROTECTED BY THE PRECISION AND UNEQUALLED DURABILITY OF TIMKEN BEARINGS



ding steel uniformly to gauge—
l within tolerances specified by
el buyers today—requires accu-
e rolling equipment. By using
MKEN Roll Neck Bearings a large part of the
el operator's problems in maintaining gauge are
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rability in the steel industry, where they have a
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es, TIMKEN Bearings have rolled well over 2,000,000 tons and are still giving
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The uniformity of **WIRE**

REPUBLIC STEEL
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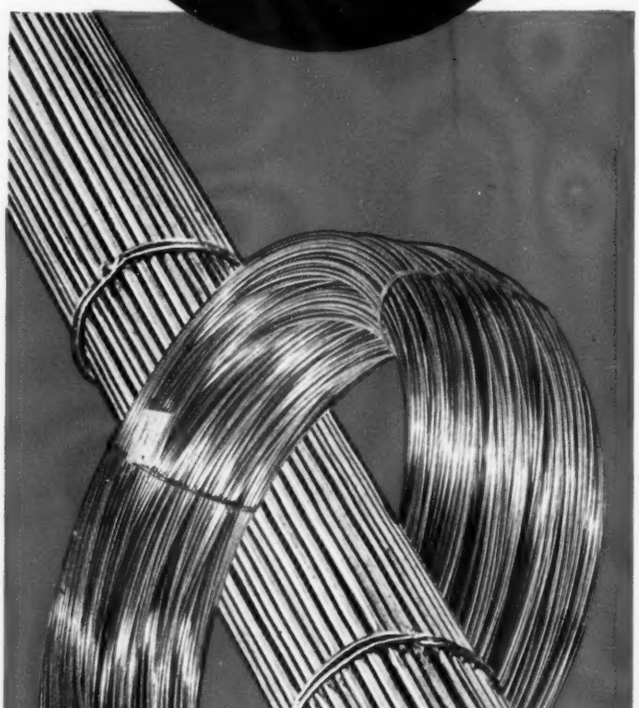
Whatever you make from wire — however you make it — you can depend on RepublicWire to meet your every requirement. Coil after coil, it is highly uniform in analysis, gauge, temper and strength — uniform in coiling and knotting qualities — uniform in fine surface finish.

Let us tell you more about this high quality wire and how it will help you to improve products and cut production costs. Republic Steel Corporation, Wire Division, 7850 So. Chicago Ave., Chicago, Ill. — General Offices, Cleveland, Ohio.



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Basic Open-Hearth and Bessemer (Annealed, Regular Hard Drawn, Sul Coated, Bright, Extra Bright, Copper Coated, Liquor Finish, Galvanized) — Spring Wire — Enduro Stainless Steel Wire — Toncan Iron Wire — Cold Heading Wire — Wire Rods.

When writing Republic Steel Corporation for further information, please address Department ST.

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Steel House Mobile Unit

To the Editor:

In the spring of 1936 when R. G. Le Tourneau was opening his new plant in Peoria, Ill., he was confronted with a situation of housing shortage. He immediately decided to build houses which he would rent to his employes. His next decision was to use the material with which he was most familiar, that of course being steel, as he manufactures heavy earth-moving equipment.

The first house of steel which was erected used steel junior I-beam framing with steel sheets welded to the outside and asbestos sheets set on the inside and insulated with rock wool. Of course, this I-beam structure transmitted heat and cold very readily and this house was considered a failure.

It was then decided to use plate or panel construction and no framing. These plates were to be of 10-gage steel made into a lattice beam of 4-inch thickness for side and partition walls; 6-inch thickness for ceilings and floors. After these beams were assembled, they were thoroughly coated with Milar's No-Krode primer on the inside of the sheets and protected on the exterior with the primer and Sherwin-Williams red non-corroding paint. . .

The whole theory was to build a house of thermos-bottle construction, proof against fire, vermin, termites, in fact, proof against anything. These houses are sanitary because of ease of keeping them clean.

We did not ask the employe whether he had children; as these houses are indestructible.

We contemplate building these in complete units and hope to have the co-operation of city and state officials to the extent that we may move them down highways during the lull in traffic hours and place them completely built in their selected locations.

All the houses have a unique heating, air-conditioning and ventilating unit. In order to have a unit which was mobile, we had to build of heavy construction and strength. These units can be picked up and moved with ease with modern machinery. While it will be possible to ship the houses knocked down, this is not our idea, but in many cases it will be necessary.

We believe, however, when the state and city authorities are thoroughly familiar with our transportation of these houses, they will issue permits for moving them on the highways.

It is our idea that enough houses are needed in every industrial center to justify the erection of a plant in that locality, thereby eliminating many transportation problems to a large extent.

J. J. MILAR

R. G. Le Tourneau Inc.,
Peoria, Ill.

Social Security Costs

To the Editor:

I was very much interested to read the article in this week's (June 6) STEEL as to the cost of the social security taxes in relation to the steel industry. I think this article is very timely as it is my opinion that not enough attention is being paid to the considerable increase in cost which the social security taxes have made in the steel industry and in similar industries where labor is a large factor in the finished cost of the articles sold.

The direct cost of the taxes themselves is bad enough now and, of course, unless the act is modified, the taxes will increase considerably with the increased percentages. In addition to the direct cost of the taxes, there is considerable expenditure necessitated in keeping the records and making up the reports called for by the various state and federal authorities. If it were possible for the state authorities and the federal authorities to get together and standardize on the reports and the basis of taxation, it would help considerably.

I think you are to be commended in bringing forward, at this time, the very much increased cost of doing business due to these social security taxes.

J. S. SNELHAM

Vice president and Comptroller,
Continental Can Co. Inc.,
New York.

Beware the Squeeze Play

To the Editor:

Consider the plight of the American railroads!

Consider the drift of events in the steel industry!

Is there a lesson in the former to be applied in the latter, to avoid the lamentable financial condition that now confronts the carriers?

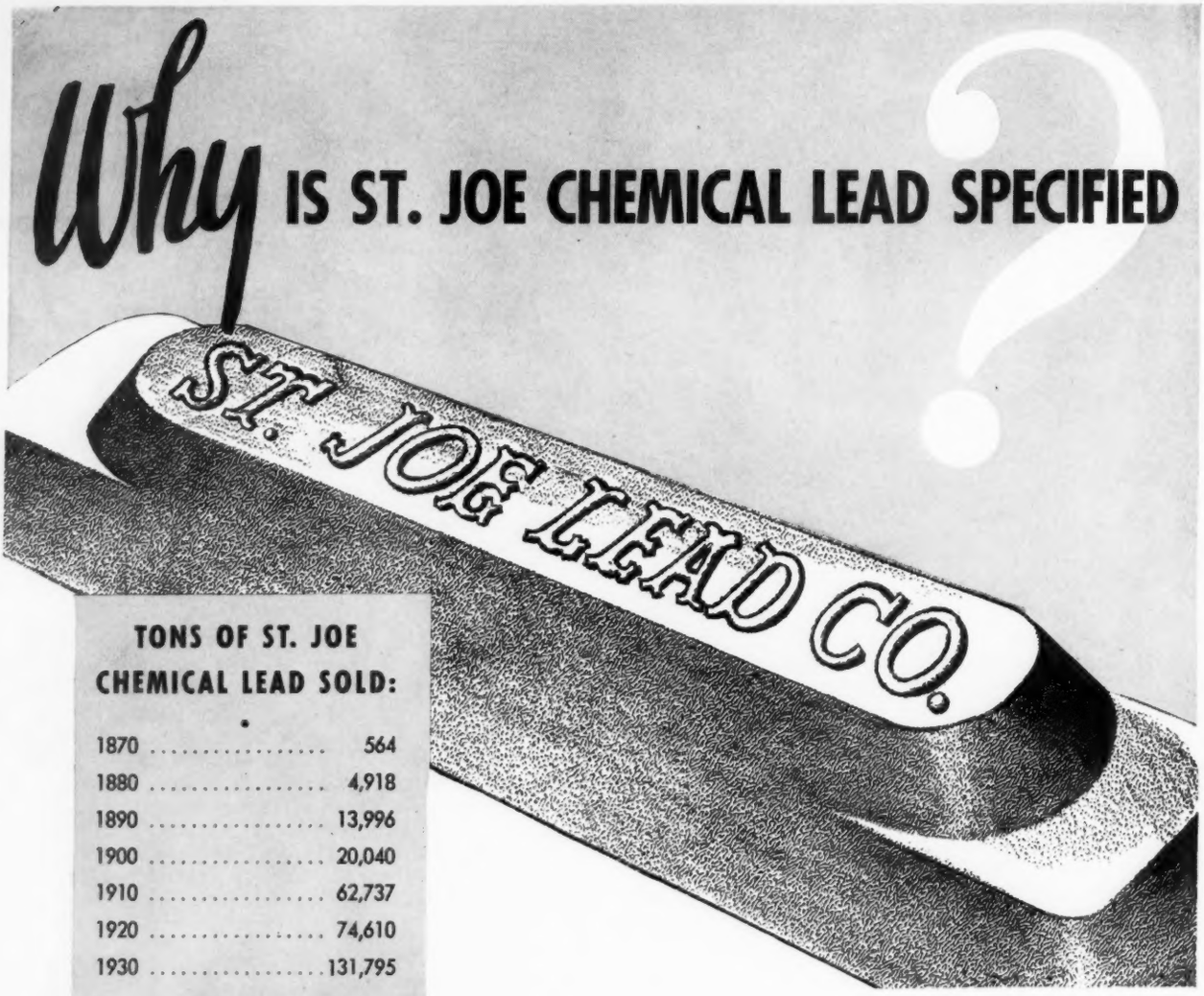
With its labor costs rigidly upheld and its income as rigidly determined, both by governmental agencies, the railroad industry is ground between two forces it is powerless to modify. The result is present or threatened bankruptcy.

In the steel industry the national labor relations board is giving every aid to labor in maintaining wages in the face of small volume of business and taxes are mounting to unprecedented heights, setting a high level of expense for steelmakers.

Now the weight of the adminis-

(*Please turn to Page* 89)

Why IS ST. JOE CHEMICAL LEAD SPECIFIED



TONS OF ST. JOE CHEMICAL LEAD SOLD:

1870	564
1880	4,918
1890	13,996
1900	20,040
1910	62,737
1920	74,610
1930	131,795

• *Why the steady increase?* Because of its physical and chemical properties. *Why are these properties unusual?* Because they remain constant decade after decade. *How can they?* Since 1865, St. Joe Chemical Lead has been made direct from bismuth-free ores originating in the Company's own lead mines in South East Missouri, to which no scrap or secondary metal is added. *Why is St. Joe Lead preferred by the chemical industry?* Because of its high resistance to creep and corrosion. *Why is it imitated?* The above sales figures tell the story. *Why is St. Joe Chemical Lead specified?* The refined lead contains .06% copper and a small amount of nickel and silver. Research established that while certain elements improved the creep rate they lowered the corrosion resistance and, conversely, other elements improved the corrosion resistance but increased the creep. St. Joe Chemical Lead stood the test of time because it contains those elements which combine to give the maximum corrosion resistance with minimum creep. Any new alloy has yet to prove itself.

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Published by THE PENTON PUBLISHING CO., Penton Building, Cleveland, Ohio. JOHN A. PENTON, Chairman of Board; E. L. SHANER, President and Treasurer; J. R. DAWLEY and G. O. HAYS, Vice Presidents; F. G. STEINEBACH, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879
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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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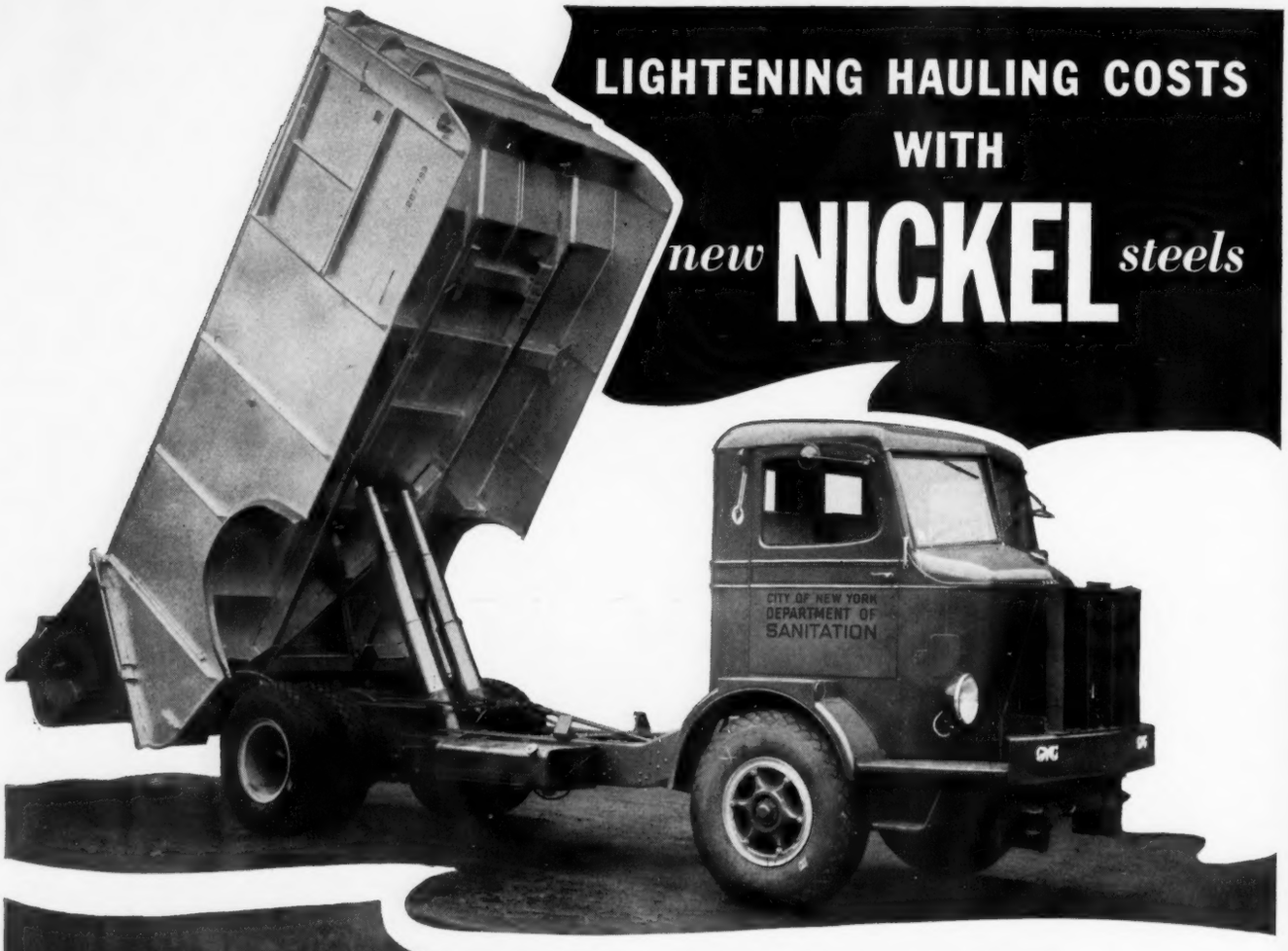
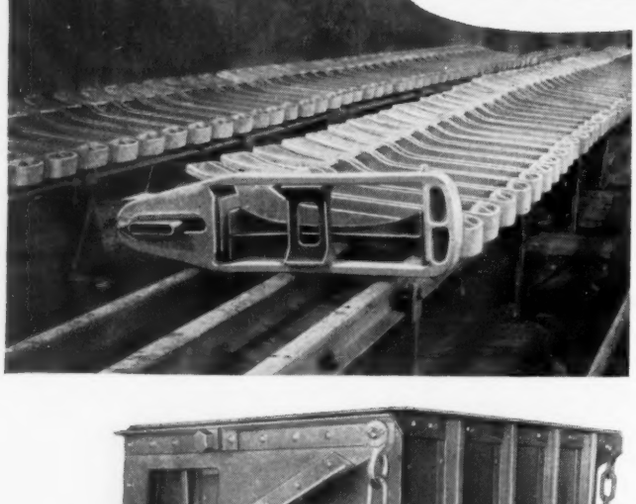
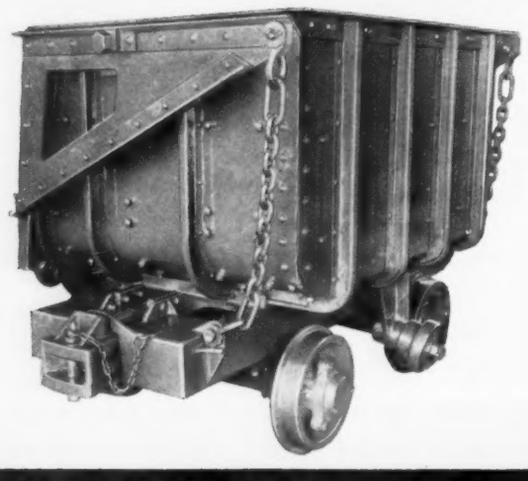
PRODUCTION • PROCESSING • DISTRIBUTION • USE

LIGHTENING HAULING COSTS WITH *new* NICKEL *steels*





..ON MANHATTAN STREETS—To save trucking tons of deadweight through congested traffic, the City of New York specified its new fleet of refuse trucks with lightweight, high-strength bodies of "Yoloy". These self-loading, self-dumping bodies were built by Gar Wood Industries on GMC chassis. Yoloy is a Nickel-copper steel which resists wear and corrosion. It is produced by the Youngstown Sheet & Tube Co.



..OVER MOUNTAIN GRADES—The progressive Union Pacific Railroad has learned that freight car castings can be lightened 20-25% by utilizing Nickel cast steels. These tough Nickel alloy steel bolsters were produced by the Buckeye Steel Castings Company for the Union Pacific's modern new freight cars.

.DEEP IN MINES—3,000 feet down in a Copper Cliff mine, rust and corrosion continuously attack metals. Hurried loading and dumping of ore-bearing rock causes severe abrasion. To cut handling costs, light-weight Granby-type mine cars of Nickel alloy steels were ordered from the Canadian Car & Foundry Company. This modern Nickel alloy steel equipment so markedly reduced operating and repair costs that 123 additional cars will soon be in use.

THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N.Y.

As the Editor Views the News

■ FIRST move in the administration's 1939 drive against business was last week's action of the senate judiciary committee in reporting favorably (p. 29) the resolution providing for creation of a committee to study the antitrust situation. This is in compliance with the recommendation in a recent Presidential message. The resolution is expected to become a law before congress adjourns. The committee will consist of three senators, three congressmen and one representative each from the departments of justice, treasury and commerce and the federal trade and securities and exchange commissions. It is expected that much of the committee's report, to be submitted at the next session of congress, will be devoted to the steel industry's base price system.

• • •

Also favorably reported by the senate judiciary committee was an amendment by which the Walsh-Healey act (p. 30) would apply to all government contracts in excess of $2000, instead of $10,000 as at present. . . .

Strikes Down In Britain

When President Roosevelt's commission visits England it will not find the British trade disputes act the ideal answer to questions involved in labor relations. It will find, however, that labor troubles in England have been much less pronounced since the law was enacted in 1927, whereas enactment of the Wagner act in this country (p. 15) has been followed by an enormous increase in labor troubles. . . . First section of the federal trade commission's report on the agricultural implement and machinery industry (p. 18) infers there is no monopoly in this industry.

• • •

To illustrate the extreme to which left-wingers would go if given a free hand, one of steel's leading spokesmen last week cited the bill for nationalization of the steel industry which, he said, would get at least 100 votes if by any chance it were offered now. Under this bill, now regarded as unlikely of action at this session, the steel industry of the country would be managed (p. 17) by nine men, five to be appointed by the President and four to be elected by the hourly wage earners in the industry. . . . At Detroit (p. 25) the Middle Class Alliance has been launched. It proposes to organize 60 to 65 per cent of our population known as the "middle class," to the end that this class may assert itself more effectively in our national life.

Open Season On Business

• • •

Cost of machining die castings may be much lower than generally realized. Ingenious tooling methods, involving light machines and special jigs and fixtures enable one company (p. 34) to effect important economies. . . .

Machining Costs Cut

Minor variations in amounts of common constituents of iron in the blast furnace (p. 43) exert an important effect on the quality of steel. . . . Improved quality spring wire is claimed with a new machine (p. 43) which incorporates a water cooling system for curtailing duration of the critical heat; the wire takeoff is overhead rather than through the block center. . . . Efficiency in handling small castings has been improved at one plant (p. 47) by using automatic skid boxes located at operating level and slightly tilted.

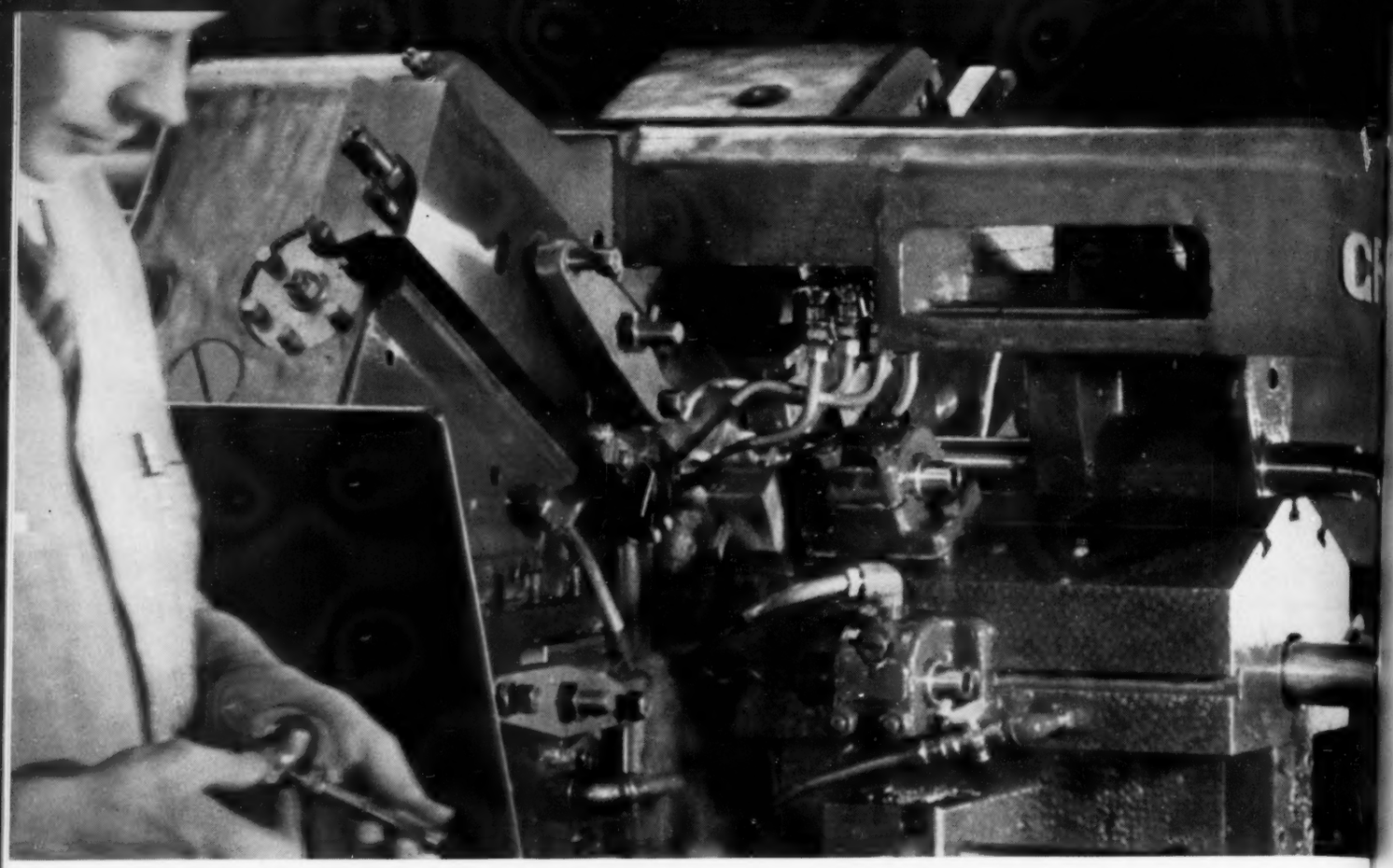
• • •

Impressive accomplishment in recent years has been the continued development of new products made of flat-rolled steel. Recent new products of such material (p. 64) include an arched cover for protecting expensive lumber and a new line of rowboats. . . .

Flat-Rolled In New Uses

High-speed hacksaws are used economically by one manufacturer in cutting ends of angles to be used in crawler tractor frames; their use (p. 62) eliminates different tools, setups and rehandling. . . . Coal, with stoker firing, is found (p. 54) to yield even penetration at low cost in a carburizing furnace. . . . Forged crankshafts now are produced in one modern shop (p. 50) in a 4½-hour cycle. . . . Complete new line of turret lathe tools (p. 52) permits greater versatility and reduction of tool change time.

E. L. Shaner



Ledloy–Inland's New Lead-Bearing Steel Breaks Machining Records

For years Industry has been seeking a steel of Open Hearth qualities, combined with easy machinability. Inland's long continued metallurgical research has resulted in the development of Ledloy to meet this need. Inland Ledloy machines faster than high sulphur Bessemer screw stock (SAE-X1112) . . . 30% to 60% faster than SAE-1120.

In all other physical properties, except for slight refinement of grain structure, the new Inland Ledloy is exactly the same as any other Open Hearth Steel of similar analysis.

Tool life increased 200%

Another example of the outstanding machining characteristics of Inland Ledloy in the form of cold drawn bars has just been reported by a manufacturer as follows:

Operations: box mill, center, tap, form, cutoff.

High sulphur Bessemer screw stock (SAE-X1112) requires 80 seconds per part. The same operations were performed on Inland Ledloy 1120 Cold drawn bars in 60 seconds. The use of Inland Ledloy resulted in 33⅓% saving in machining time and 200% increase in tool life!

Broad Application

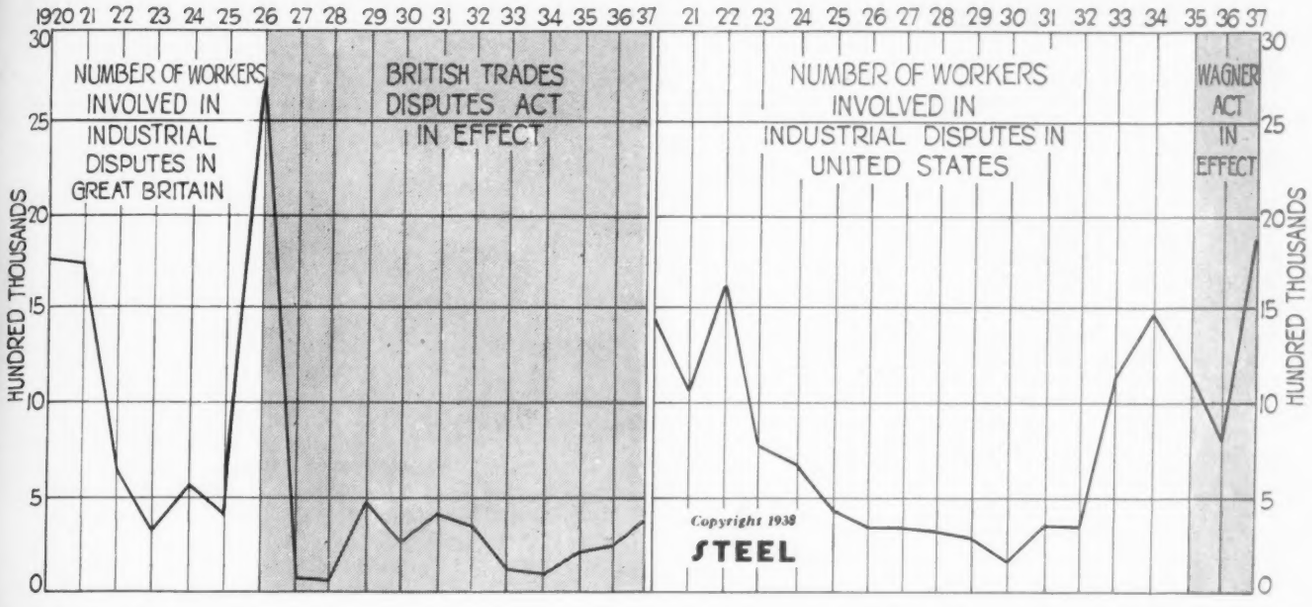
Inland Ledloy can be made immediately available in all hot and cold rolled forms with similar advantages in machinability. It brings a new source of economy to the metal working industries.

Estimate the savings this new kind of Open Hearth Steel can make in your plant. Then write to the Inland Steel Co., 38 South Dearborn Street, Chicago, for a copy of the Inland Ledloy Bulletin.

INLAND LEDLOY

INLAND PRODUCTS INCLUDE

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS


1920 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
NUMBER OF WORKERS INVOLVED IN INDUSTRIAL DISPUTES IN GREAT BRITAIN
BRITISH TRADES DISPUTES ACT IN EFFECT
NUMBER OF WORKERS INVOLVED IN INDUSTRIAL DISPUTES IN UNITED STATES
WAGNER ACT IN EFFECT
HUNDRED THOUSANDS
HUNDRED THOUSANDS
30
25
20
15
10
5
0
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STEEL

■ **Before and after passage of Great Britain's trade disputes act compared with "before and after" the Wagner act in United States. Figures from Ministry of Labor Gazette and United States department of labor**

Strikes Down, Under British Labor Law; Rise Sharply, Under Wagner Act

■ COMPARISON of Great Britain's experience under its trade disputes and trade union act of 1927 with that of the United States under the Wagner act is complicated by differences in the political and economic factors of the two countries, and also by the relatively short experience of the United States under the Wagner act.

The British act has been in effect 11 years; the Wagner act, little more than two years.

The British act was devised—following the great general strike of 1926—to make organized labor more responsible, and to forbid any labor movement of a general or sympathetic character intended to paralyze commerce or the orderly processes of government.

The Wagner act was conceived with the purpose of giving labor more liberties.

Under the British act there has been notable reduction in the average number of disputes, and also the number of workers involved.

Under the Wagner act both the number of disputes and the workers involved have increased.

When President Roosevelt's commission to study the British act delves into the situation it will find: The average number of strikes and lockouts in Great Britain from 1920 through 1926 was 744 per year. From 1927 through 1937 the average was 508 per year.

Average number of workers involved from 1920 through 1926 was 1,155,000 per year; from 1927 through 1937, the average was 254,000 a year. The former figure was swelled by the general strike in 1926. Eliminating 1926, the average for the preceding six years was 893,833.

Increased in United States

In sharp contrast is the United States' experience under the Wagner act. From 1920 through 1935, average number of strikes per year was 1383. The 1936 and 1937 average was 3456. Average number of workers involved from 1920 through 1935 was 742,000 per year. For 1936 and 1937, it was 1,325,000 per year.

The figures are comprehensive, from the *Ministry of Labor Gazette* and the United States labor department, respectively.

For detailed statistics for both countries, see table, p. 16.

Close study of the trade disputes act and earlier legislation shows, however, the British law is less comprehensive and less effective than generally supposed. It has failed to eliminate jurisdictional and sympathetic strikes. Of a total of 818 disputes in 1936, 20 were sympathetic. Issues arising from employment of particular classes of persons were responsible for 219 disputes, and questions of trade union principle for 82.

The law does not require a union to incorporate or to submit to audit of any but special "political" funds.

Nor can a British trade union be sued for damages, except in case of an illegal strike, which is defined as any strike that: "Has any object other than, or in addition to, the furtherance of a trade dispute within the trade or industry in which the strikers are engaged; and is a strike designed or calculated to coerce the government either directly or by inflicting hardship upon the community.

Importance of the second condition is indicated by the fact 2½ per cent of all strikes in 1936 were sympathetic; yet they were not ruled illegal because in no case was it proved they were designed to coerce the government.

British law, however, makes a criminal offense the breaking of an

employment contract where the act may endanger human life or property. Instigators of sitdowns in American automotive plants where strikers seized plants and equipment probably would have been dealt summary punishment under British law.

Breach of employment contract in the case of utilities which may result in injury, danger or grave inconvenience to a community also is treated as a criminal offense.

Penalty for illegal strikes and lockouts is a fine of not more than 10 pounds or imprisonment for not exceeding three months in case of summary conviction, and imprisonment for not in excess of two years in case of conviction on indictment.

The act imposes restrictions on the conduct of strikes in general.

Picketing becomes unlawful if strikers "attend in such numbers or otherwise in such manner as to be calculated to intimidate any person in that house or place, or to obstruct the approach thereto or egress therefrom, or to lead to a breach of the peace."

"Intimidation" Forbidden

"To intimidate" is defined to include any conduct causing "in the mind of a person a reasonable apprehension of injury to him or to any member of his family or to any of his dependents or of violence or damage to person or property."

Picketing or watching the residence of a worker for the purpose of inducing him to work or to abstain from working is prohibited.

Contributions to a political fund may be required of union members only after they have individually furnished written notice of their willingness to contribute. No assets of a union other than those of a separate "political" fund may be applied to the furtherance of any political object.

All unions are required to report receipts, expenditures and other facts regarding use of "political" funds.

Although trade unions are not compelled to incorporate, about 80 per cent of them are registered, which means they have complied with government regulations which demand they: (1) show an object for organizing; (2) amend their charter rules only according to prescribed methods; (3) have definite provisions for appointment of officers.

To register, the union must set up a board of directors or trustees who accept responsibility of representing the union in property and financial matters. The trustees have authority to collect dues; to buy, sell, mortgage or lease property; and to bring and defend suits concerning union property.

They are liable for funds entrusted to their care, but cannot be held responsible for any deficits not personally incurred, and they are required to present audited accounts at least once a year to a registrar.

Arbitration Not Compulsory

Because registered unions have many privileges and responsibilities of incorporation, it has been assumed by many that all British unions are incorporated.

Arbitration of disputes is not required by law. Most disputes are settled by conciliation boards, composed of representatives of labor and management. If the board fails to reach an agreement a neutral umpire is called in.

In case of a general strike, criminal liability is imposed on all union officials, but not the workmen.

When unions are found guilty of illegal strikes, damages can be levied on union funds. Under the same circumstances, union members expelled for continuing work are allowed to claim damages from union funds.

Checkoff is illegal and employers are not permitted to make deductions from a worker's pay, except as designated by law for unemployment and health insurance and old age pensions.

Open shop prevails with but few exceptions. Exceptions include the printing industry and a few skilled branches of the metalworking industries.

Civil service employes may form their own unions but cannot—with some exceptions—be affiliated with outside unions.

Approximately one-third of Britain's 15,000,000 workers are union members.

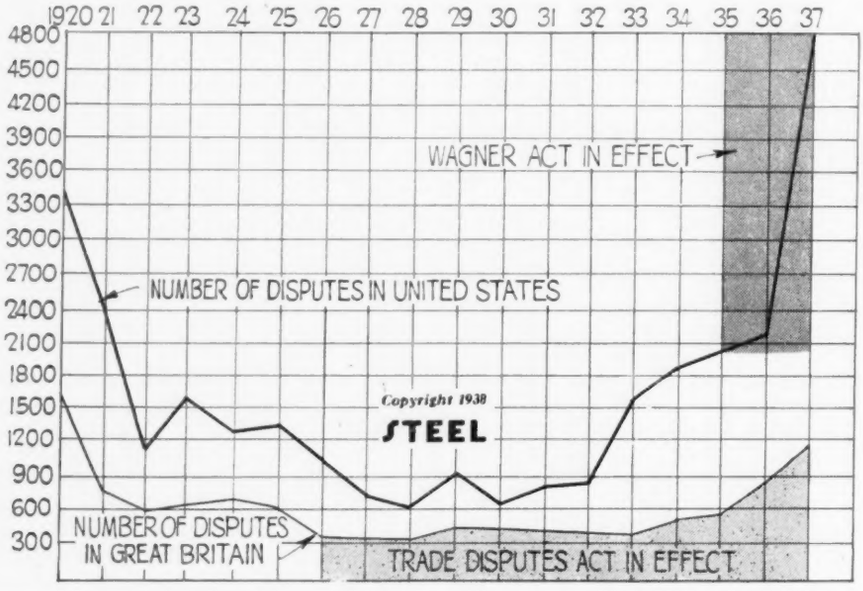
Strikes and Lockouts in Great Britain and U. S.

Great Britain

Year	No. of Disputes	Workers Involved
1920	1,607	1,779,000
1921	763	1,770,000
1922	576	512,000
1923	628	343,000
1924	710	558,000
1925	603	401,000
1926	323	2,724,000
1927	308	90,000
1928	302	80,000
1929	431	493,000
1930	422	286,000
1931	420	424,000
1932	389	337,000
1933	357	114,000
1934	471	109,000
1935	553	230,000
1936	818	241,000
1937	1,122	390,000

United States

Year	No. of Disputes	Workers Involved
1920	3,411	1,463,000
1921	2,385	1,099,000
1922	1,112	1,613,000
1923	1,553	757,000
1924	1,249	655,000
1925	1,301	428,000
1926	1,035	330,000
1927	707	330,000
1928	604	314,000
1929	921	289,000
1930	637	183,000
1931	810	342,000
1932	841	324,000
1933	1,695	1,168,000
1934	1,856	1,467,000
1935	2,014	1,117,000
1936	2,172	789,000
1937	4,740	1,861,000



■ **One notable feature of this chart is the rise in the number of strikes and lockouts in the United States during depression years, followed by the tremendous increase under the Wagner act. Figures from the United States department of labor and British Ministry of Labor Gazette**

Nationalizing Steel; How a Farmer-Laborite Would Accomplish It

■ SPEAKING to the alumni of Case School of Applied Science, Cleveland, June 4, T. M. Girdler, chairman, Republic Steel Corp., referred to the bill pending in congress to nationalize the steel industry as an example of the extremes to which the left-wing planners would go "if given a free hand."

"That bill at present is getting no serious consideration," said Mr. Girdler, "but I am told by persons close to the Washington scene that it would get at least 100 votes if by any chance it were to be offered now."

STEEL in its "Windows of Washington" has already referred briefly to the bill—house resolution 10,504—(May 9, p. 34 and June 6, p. 34). It was introduced by Representative Teigan, Farmer-Laborite, of Minnesota.

The bill is to be known, according to Teigan, as the iron and steel nationalization bill, and its purpose is not only to take over through government ownership the steel plants and blast furnaces of the country, but also all the suppliers of essential raw materials.

This includes all railroads, scrap yards, lake boats and ore mines as well as the office buildings, real estate and other properties of the mills.

The industry would be governed by nine men. They would receive $10,000 each per year. Five would be appointed by the President and four elected by the hourly wage workers in the plants. The first five would represent the people of the United States, according to Representative Teigan.

Board Would Make Rules

This national iron and steel board would have the power to establish rules, by-laws and regulations for the conduct of the industry. They would immediately begin to conduct the acquisition of the properties by offering a "fair valuation" for the properties to the owners, and if the owners fail to agree, they would, by the power of eminent domain, condemn the properties.

The board also would have the power to hire under civil service officers and employes necessary for the conduct of the business. However, the wage earners would not be hired by the board but by their own unions, which the bill gives them the right to organize.

The board would be required to submit to congress a year in advance detailed plans for the production schedules of the coming year. Congress, however, is given the power to alter the plan.

In order to make the proposal fair to the owners and creditors, the board would issue bonds in return for the stocks and bonds of the various companies, evaluated on the basis of the board's appraisal. These bonds would bear interest at a rate as yet unstated, but which, however, would be subject to a heavy income tax.

Further, the board has the power to set prices at any figure which seems advisable, and to close or operate plants at will, thus insuring "stability."

The bill is in the house ways and means committee, and according to Washington reports, is not likely to be reported out.

Stainless Steel Used in Modern Milk Plant

■ Eleven thousand, five hundred square feet of stainless steel sheets and plates and 1000 lineal feet of stainless steel pipe were fabricated in equipment for "world's largest" milk depot and distribution plant recently completed for Sheffield Farms Co. Inc., New York. Principal items are these ten pasteurizing tanks, each holding 1600 quarts, made by Creamery Package Mfg. Co., Chicago; storage tanks made by Cream City Boiler Co., Milwaukee; and heaters and coolers, by Jensen Creamery Machinery Co., Bloomfield, N. J. For plant description see STEEL, May 30, p. 38

Veteran Employes Hear Of "Logical Liberalism"

■ Farrel-Birmingham Co., Ansonia, Conn., held its second annual service banquet May 23, with 130 men who have been with the company 25 years or more as guests of honor.

Nine have a service record of 50 years or more. Service pins were presented to 12 who completed their 25 years' employment during the past year. John D. Martin, who had just finished 50 years' service, was given a gold watch and chain.

Nelson W. Pickering, president, was toastmaster and Franklin Farrel Jr., chairman of the board, made the awards. Louis M. Ruthenburg, president of Servel Inc., praised the loyalty of the employes and urged them to view industrial relations with "logical liberalism."

"On logical liberalism," he said, "rest the hopes of the nation for a continuation of the American system."

Predicts $13,000,000,000 Electric Expansion

■ Doubling of the electric light and power industry's plant investments to meet greater demand for service was predicted at the Edison Electric institute's annual convention at Atlantic City, N. J., last week by Arthur H. Kehoe, vice president, Consolidated Edison Co. of New York Inc.

Such an increase would bring total investment in plants and equipment to approximately $26,000,000,000, compared with $13,000,000,000 at present.

Trade Commission Finds Competition Instead of Monopoly in Farm Tools

■ FEDERAL trade commission has issued the first part of its report on an investigation of the agricultural implement and machinery industry, complying with a joint resolution of congress. No recommendations or conclusions are made, possibly pending completion of the report.

The inference, however, is that there is no monopoly in the industry, the proportion of production in the hands of larger manufacturers having decreased as others entered the field. Competition exists and strong independent interests have developed. While ownership in some instances is in the hands of a few stockholders there is no interlocking of directors or ownership. Since implements have become fairly standardized prices naturally are more uniform.

Implied criticism is made of the practice of following the leaders in pricing, and public relations activities are also disapproved in certain instances.

The first section of the report deals with the history of the industry, and its development by which most of the production and distribution has become concentrated in the hands of a few large companies; extent of this concentration; the nature of distributive organizations and agencies; trade association activities; competitive methods pursued by manufacturers and dealers, with special attention to methods which may involve restraints of trade or tendencies toward further concentration of control or monopoly.

The second section will present accounting and statistical studies, dealing with investments, profits, prices and costs of machines and implements.

Finds Production Concentrated

The report states it has found that most production is in the hands of a relatively small number of large manufacturers, of which eight are the principal "long-line" companies. These are International Harvester Co., Chicago; Deere & Co., Moline, Ill.; J. I. Case Co., Racine, Wis.; Allis-Chalmers Mfg. Co., Milwaukee; Oliver Farm Equipment Co., Chicago; Minneapolis-Moline Power Implement Co., Minneapolis; Massey-Harris Co. Inc., Racine, Wis.; and B. F. Avery & Sons Co., Louisville, Ky.

Long-line companies are those manufacturing a broad assortment of implements, as contrasted with short-line producers, which concentrate on a few implements or machines.

Products of short-line manufacturers in many instances are directly competitive with those made by long-line manufacturers. Concentration in a few large companies has developed gradually, the trend being away from specialized manufacture and toward lengthening of the lines manufactured by a few long-line companies. This, the report states, has come about by absorption of independent companies, by building new plants or conversion of old factories to new products.

Maintaining Control Is Difficult

Four to six of the eight leading long-line companies are said to dominate manufacture and sale of certain important farm implements in the United States. In 1936 four of these companies made all the corn binders, five made 96 per cent of the grain binders and six made 97 per cent of tractors and accompanying cultivators and a high percentage of other implements.

"International Harvester Co. is by far the most important manufacturer of most types of implements and machines with Deere & Co. second. No manufacturer is third in more than a few types.

"Although International Harvester Co.'s production of implements is greater by far than that of any other company its proportion of the total production of harvesting machines, in which it held a monopoly when it was formed through consolidation of the five largest manufacturers of such machines in 1902, has been decreasing.

"For example, it produced 56.5 per cent of grain and rice binders in 1936, compared with 90 per cent in 1902. Of mowers it produced 53 per cent in 1936 as compared with 80 per cent in 1902. For some other implements, however, its proportion has increased in recent years. It produced 25.9 per cent of disk harrows in 1909 and 38.7 per cent in 1936. It produced 20.8 per cent of the hay loaders in 1909 and 35.1 per cent in 1936.

"Maintaining control over production of the newer types of tractors and tractor-operated implements and machines is more difficult than over the older types. For instance, in 1935 International Harvester Co. made 32 per cent of all the harvester combines sold for use in the United States and Allis-Chalmers Mfg. Co. made 14 per cent.

"Following introduction by Allis-Chalmers of its small combine, its proportion of the total number sold increased to almost 46 per cent in 1936 while that of International

(*Please turn to Page* 88)

Trailer Takes Shop to Customer

■ **Lake City Malleable Co., Cleveland, will display its products at the customer's door in an especially built and illuminated trailer. Because many sales have been traced directly to displays at expositions and conventions, the company decided on this plan to stimulate demand. The trailer will cover all territory in which company has representatives**

Apprentice in 1909, Now Heads New Allegheny Ludlum Steel Corp.

■ AN APPRENTICE in electrical engineering from the Westinghouse plant, East Pittsburgh, Pa., became a time-card employe on the night shift at Allegheny Steel Co.'s plant, Brackenridge, Pa.. in 1909. Last week it was announced W. F. Detwiler—the former apprentice—will head the Allegheny Ludlum Steel Corp., as chairman of the board.

The executive personnel and capital set-up became known in calls to shareholders to special meetings Aug. 10 to ratify the proposed Allegheny and Ludlum Steel Co. merger, recently approved by their directors.

Hiland G. Batcheller, now Ludlum president, is slated to be president of the new company.

Detwiler—in his rise from apprentice to steel chairman in 29 years—was made plant manager at Brackenridge in 1918; general manager, 1928; vice president, 1931; executive vice president and director, 1934. He was elected president April 27, 1937.

He is a director of the American Iron and Steel institute, state director of the National Association of Manufacturers, and a director of the Pittsburgh Army Ordnance association. His main hobby is farming.

Started as Salesman

Mr. Batcheller began in the steel business in 1909 as a salesman for Carnegie Steel Co.'s Waverly warehouses, and later as mill salesman. In 1915 he was made assistant to the president of Ludlum; elected vice president three years later. He was elected executive vice president in 1925 and president in December, 1930.

He is chairman of the board, Wallingford Steel Co.; president, Forging & Casting Corp.; a director of the State Bank of Albany, of Canadian Atlas Steels Ltd., and of the Nitralloy Corp.

Other officers of the Allegheny Ludlum corporation—with their present affiliations—will be:

Vice president, V. B. Browne (Allegheny).

Vice president, James O. Carr (Allegheny).

Vice president, E. B. Cleborne (Ludlum).

Vice president, A. F. Dohn (Ludlum).

Vice president in charge of manufacturing, W. A. Givens (Allegheny).

Vice president, Lewis W. Hicks (Allegheny).

Vice president, Frank B. Lounsberry (Ludlum).

Vice president and treasurer, F. H. Stephens (Allegheny).

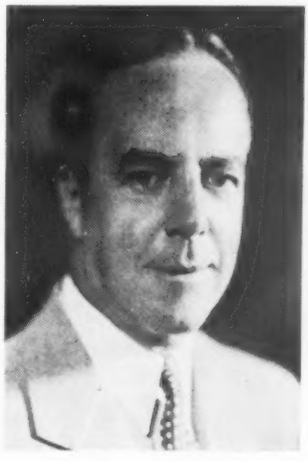
W. F. Detwiler

Secretary, E. J. Hanley (Allegheny).

Assistant secretary and assistant treasurer, A. W. Mace (Ludlum).

Auditor, W. L. Dankmyer (Allegheny).

The board will consist of 19 members, of whom 12 are at present associated with Allegheny, and seven with Ludlum.



Hiland G. Batcheller

From Allegheny: Arthur E. Braun, V. B. Browne, James O. Carr, W. F. Detwiler, W. A. Givens, Lewis W. Hicks, William C. Kirkpatrick, Malcolm W. Leech, William M. McKelvy, W. E. Ruder, F. H. Stephens, and S. L. Whitestone.

From Ludlum: H. G. Batcheller, James C. Brady, E. B. Cleborne, A. F. Dohn, Frank B. Lounsberry, Frederick McDonald, and Neile F. Towner.

Authorized capital stock will be the same as the present authorized capital stock of Allegheny, 850,000 shares, plus Ludlum's outstanding capital stock, 500,000 shares.

As of Aug. 10, 1938, the outstanding common stock capitalization of the merged company, excluding treasury shares, will be 1,250,896 shares representing the sum of 752,696 shares of Allegheny common now outstanding and 498,200 shares of Ludlum common now outstanding.

Authorized common stock capitalization will be 1,350,000 shares, of which 5789 shares will be reacquired treasury shares, and 93,315 authorized and unissued shares for the account of the merged company. Allegheny's 33,426 issued shares of $100 par value preferred stock will continue as a part of the total capitalization.

No financing is associated with the merger. Upon the effective date, holders of common stocks of Ludlum and Allegheny will be entitled to receive one share of common for each share already held in either or both companies.

Total Assets $31,815,060

Based on consolidated balance sheets of both companies as of Dec. 31, 1937, and without reflecting any changes which may have occurred since that date, the merger will result in an organization with fixed assets, after depreciation, of $17,790,519, and with total assets of $31,815,060.

Combined current assets of $13,218,516, would compare with combined current liabilities of $3,186,506, indicating a working capital of about $10,032,010.

Allegheny's net sales in 1937 were $36,573,419; Ludlum's, $13,054,202. Allegheny's net profit was $1,813,707, equal to $2.10 a share on its common stock, and Ludlum's net profit was $1,120,422, equal to $2.25 a share on its common stock.

For the four months ended April 30, 1938, Allegheny showed a net loss estimated at $346,111, while Ludlum showed an estimated net loss of $139,195.

For further details concerning earnings, capacities etc., see STEEL, May 23, p. 26.

■ Twenty-six new members joined the Institute of Scrap Iron and Steel during May. Enrollment has reached a new high record with a total of 713 firms.

Capital $11,493, Salary $1561— If Big Enterprise Were Split Up

■ HOW the balance sheet and profit and loss statement of one large American corporation would look if employes had divided the business and each had operated as a one-man concern is described in "Koppers Yearbook—1938," just published by Koppers Co., Pittsburgh.

Stating that the largest corporation is no different than an individual operating alone in a crossroads village, the book continues:

"To make clear the financial facts as to one corporation, the balance sheet and profit and loss statement of Koppers Co. (not including its affiliates) are here presented in terms of a single employe as an individual unit.

"Koppers Co. with its subsidiaries is, like every other corporation, an aggregation of individuals working together for a common purpose, combining their efforts in order that each may function more effectively than if he acted alone. In 1937, slightly more than 10,000 men and women so combined in the Koppers organization. If each of these individuals had operated singly and alone, his financial picture would have been as follows:

"If this individual followed the pattern set by Koppers and other corporations, he would obtain his capital—so far as he could not furnish it himself—by selling bonds and preferred and common stocks to individuals, to banks, insurance companies and similar organizations . . . . The total amount of such capital would be $11,493.

How Capital Would Be Used

"Some of this capital would be used to construct a plant and other facilities needed to produce goods and to render services. Part of it would be advanced to other individuals carrying on businesses along lines similar to his own, for which he would hold stock or bond certificates entitling him to a share in the profits of those enterprises. The remainder of his money would be used to buy raw materials, to carry finished goods pending their sale, to carry accounts receivable until customers could meet their obligations, or would remain in the form of cash.

"In 1937, this hypothetical individual would sell products and render services to customers, and would receive money from his investments in the form of dividends, and interest, to a total of $6685. This revenue he would spend as follows:

"For the purchase of raw materials from which his products were made, principally coal, timber, steel and fire brick; for power and supplies used in his manufacturing operations; for freight on raw materials and finished products; for traveling and other expenses necessary to carry on the business, $4181.

"For taxes paid to local, state and federal governments, $181.

"For replacements of plants, machinery and equipment no longer useful, and for provisions to take care of anticipated replacements in future years, in order to keep facilities usable—termed by the accountant 'depreciation and depletion', $178.

Where Are Big Profits?

"For salaries and wages paid to himself for his time and efforts in carrying on the business, $1561.

"After these expenditures, the remainder of his receipts would belong to the individual business man and to those others who joined with him in risking the $11,493 capital. Part of this would be paid in the form of interest and dividends to those furnishing the money; part he would retain to expand and develop his business, thereby increasing the investment with the hope of increasing the profits. The total amount available for these purposes, in 1937, would amount to 5.1 per cent of the $11,493, or $584."

The Yearbook also discusses the company in the role of a taxpayer, employer and shipper.

Taxes paid in 1937, it is stated, were 75 per cent greater than the total amount paid to stockholders. They were equal to six weeks' wages for each of its 10,029 employes. It is pointed out that the major share of these taxes was not based upon company earnings and there were no excess or undistributed profits taxes to be paid.

Employment increased 11 per cent during the year while total payrolls were 20 per cent greater.

Shipments of freight totaled 23,264,000 tons of which 21,024,000 were shipped by rail and 2,240,000 tons by truck. Of the rail shipments 9,228,000 tons made part of their journey by water.

Schedules Tenth Course On Metal Radiography

■ St. John X-Ray Service Inc. announces its tenth metal radiography training course at its laboratory, 30-20 Thomson avenue, Long Island City, N. Y., during the week of June 20. This is the week just preceding the annual meeting of the American Society for Testing Materials in Atlantic City, N. J.

The course will cover the physics of X-rays, tubes, X-ray technique, X-ray as an inspection tool, interpretation of results, equipment installations, operating and cost data, and gamma ray inspection. Theory will be as brief as possible and merely the influence of various factors upon results will be demonstrated and discussed. Purpose of the course is to teach how to make and how to interpret radiographs.

MEETINGS

MALLEABLE GROUP MEETING IN ANNUAL CONVENTION

■ MALLEABLE Founders' society will hold its annual convention at White Sulphur Springs, W. Va., June 16-17. First day's sessions will feature papers on "Gating and Feeding," by Enrique Touceda, consulting engineer of the society, Albany, N. Y; "Reducing Costs," by John A. Wagner, president, Wagner Malleable Iron Co., Decatur, Ill.; and "Public Relations," by E. E. Guest, vice president and general manager, Fort Pitt Malleable Iron Co., Pittsburgh.

Program for the second day includes a technical exposition of malleable as an engineering material, by Dr. Touceda and James H. Lansing, shop practice engineer of the society, Cleveland; a paper on "Wage Differentials and Job Evaluation," by Anthony Haswell, first vice president, Dayton Malleable Iron Co., Dayton, O.; report on a committee study of pearlitic malleable, by Homer M. Wright, Michigan Malleable Iron Co., Detroit; and report of a study of annealing methods and equipment, by Mr. Lansing.

New officers will be elected and research and development programs formulated.

TRANSIT GROUP CALLS OFF EXHIBIT; DEFERS MEETING

Fifty-seventh annual convention of the American Transit association, previously scheduled in Atlantic City with an exhibit, Sept. 19-22, will now be held without an exhibit at the Royal York hotel, Toronto, Ont., Oct. 3-6. This change was made because manufacturer members recommended elimination of the exhibit this year.

WHOLESALE HARDWARE MEN SELECT ATLANTIC CITY

National Wholesale Hardware association has selected Atlantic City, N. J., for its forty-fourth annual convention, Oct. 17-20. Headquarters will be at the Marlborough-Blenheim. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Ingot Output Down 6 Per Cent

■ PRODUCTION of open-hearth and bessemer steel ingots in May, 1,806,805 gross tons, was 6 per cent lower than in April and 65 per cent below May, 1937, according to the American Iron and Steel institute. Average weekly output in May was 407,857 tons, compared with 448,757 tons in April and 1,162,959 tons in May last year.

Average capacity engaged in May was 30.39 per cent. The average of STEEL'S weekly estimates for the month was 29.54 per cent, or 0.85 below the actual figures.

Figures in the accompanying table have been revised and adjusted by the institute to conform to its final statistics for 1937.

U. S. Steel Shipments Off 7.3 Per Cent in May

■ Finished steel shipments by the United States Steel Corp. in May amounted to 465,081 tons, a decrease of 36,891 tons, 7.3 per cent, from the 501,972 tons shipped in April. In May, 1937, the total was 1,304,039. For five months, shipments were 2,532,297 tons, compared with 6,345,724 tons in the same period last year.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended June 11	Change	Same week 1937	Same week 1936
Pittsburgh	19.3	+ 1.3	92	65
Chicago	22	— 0.5	63	69
Eastern Pa.	25.5	— 0.5	64.5	44.5
Youngstown	25	+ 4	30	76
Wheeling	38	None	95	68
Cleveland	31	None	46	82
Buffalo	23	+ 2	89	84
Birmingham	58	—11	83	69
New England	25	— 2	45	78
Cincinnati	16	— 6	93	80
St. Louis	39.3	None	85	†
Detroit	18	None	95	100
Average	25.5	None	74	68

†Not reported.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)
(Tons)

	1938	1937	1936	1935
Jan.	518,322	1,149,918	721,414	534,055
Feb.	474,723	1,133,724	676,315	583,137
Mar.	572,199	1,414,399	783,552	668,056
April	501,972	1,343,644	979,907	591,728
May	465,081	1,304,039	984,097	598,915
5 mo.	2,532,297	6,345,724	4,145,285	2,975,891
June		1,268,550	886,065	578,108
July		1,186,752	950,851	547,794
Aug.		1,107,858	923,703	624,497
Sept.		1,047,962	961,803	614,933
Oct.		792,310	1,007,417	686,741
Nov.		587,241	882,643	681,830
Dec.		489,070	1,067,365	661,515
Y'rly adj.			†40,859	†23,750
Total		12,825,467	10,784,273	7,347,549

†Deduction.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	1,632,275	30.24	99,991	18.27	1,732,266	29.14	391,031	4.43
Feb.	1,577,752	32.37	125,493	25.40	1,703,245	31.73	425,811	4.00
March	1,854,103	34.35	157,737	28.83	2,011,840	33.84	454,140	4.43
April	1,793,522	34.31	131,644	24.84	1,925,166	33.44	448,757	4.29
May	1,676,215	31.06	130,590	23.87	1,806,805	30.39	407,857	4.43
5 mos.	8,533,867	.....	645,455	.....	9,179,322	.....	425,362	21.58
1937								
Jan.	4,426,227	84.07	292,209	54.38	4,718,436	81.32	1,065,110	4.43
Feb.	4,083,070	85.89	331,629	68.34	4,414,699	84.27	1,103,675	4.00
March	4,814,926	91.45	403,400	75.07	5,218,326	89.94	1,177,952	4.43
April	4,682,084	91.83	388,783	74.71	5,070,867	90.25	1,182,020	4.29
May	4,769,238	90.59	382,671	71.21	5,151,909	88.79	1,162,959	4.43
5 mos.	22,715,545	.....	1,798,683	.....	24,574,237	.....	1,138,282	21.58
June	3,900,108	76.50	284,615	54.69	4,184,723	74.48	975,460	4.29
July	4,220,848	80.10	335,456	62.56	4,556,304	78.48	1,030,838	4.42
Aug.	4,504,567	85.29	373,259	69.46	4,877,826	83.83	1,101,089	4.43
Sept.	4,021,035	78.80	268,472	51.71	4,289,507	76.30	1,002,221	4.28
Oct.	3,204,209	60.67	188,715	35.12	3,392,924	58.31	765,897	4.43
Nov.	2,040,480	39.90	113,885	21.88	2,154,365	38.23	502,183	4.29
Dec.	1,386,188	26.31	86,833	16.19	1,473,021	25.37	333,263	4.42
Total	46,052,980	74.20	3,449,927	54.54	49,502,907	72.38	949,423	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ SLIGHTLY higher production at Pittsburgh and Youngstown last week practically balanced small losses in other districts and the national operating rate held at 25.5 per cent. In most centers no change is scheduled for this week.

Youngstown, O.—An increase of 4 points to 25 per cent resulted from addition of one open hearth by Youngstown Sheet & Tube Co., making 24 active out of 83, with some bessemer capacity on part time. The outlook this week is for the same.

Cleveland—Steelworks continued last week at 31 per cent, unchanged.

Detroit—Steady at 18 per cent, with four open-hearth furnaces in operation. This has been the rate since April.

St. Louis—Unchanged for the third consecutive week at 39.3 per cent. No change is indicated for this week.

New England—Down 2 points to 25 per cent. The same rate is scheduled for this week. One producer having worked off ingot inventory will resume early in July with a 100-ton furnace.

Buffalo—Increased 2 points to 23 per cent, an additional open hearth being lighted by Republic Steel Corp.

Chicago—Down ½-point to 22 per cent, the lowest since September, 1934.

Pittsburgh—Advanced 1.3 points to 19.3 per cent, due to slightly larger orders.

Wheeling—Held at 38 per cent, the same as in the preceding week.

Cincinnati—With only three open hearths active the operating rate was down 6 points to 16 per cent. Two finishing mills are operating with ingot stocks.

Birmingham, Ala.—Removal of one open hearth by Tennessee Coal, Iron & Railroad Co., brought the rate down 11 points to 58 per cent.

Central eastern seaboard—Off ½-point to 25.5 per cent. Little variation is expected for this week.

Auto Production Gains

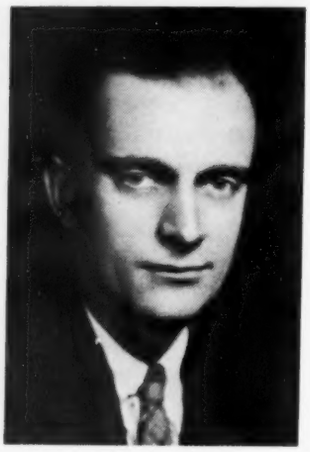
■ Automobile assemblies last week totaled 40,175, compared with 26,980 the week before, and 115,900 in the corresponding week of 1937, according to *Ward's Reports*. Comparisons:

	Week ended June 11	June 4
General Motors	17,700	15,650
Chrysler	6,195	5,475
Ford	11,775	2,000
All others	4,505	3,855

Monthly and yearly comparisons will be found on page 26.

MEN OF INDUSTRY

■ THORN PENDLETON has been appointed president and treasurer, Warren Tool Corp., Warren, O., succeeding the late C. L. Schoonover. Mr. Pendleton, who has been secretary and a director for six years,



Thorn Pendleton

is also a director of Trumbull Mfg. Co., Warren.

Other officers are: Howard Mull, vice president in charge of sales; Paul W. Frum, vice president and secretary; Albert F. Turrell, assistant treasurer; Joseph R. Fawcett, assistant secretary. Messrs. Pendleton, Mull and Frum comprise the executive committee.

♦

Leroy Blue has been appointed general freight agent for the Pittsburgh & Lake Erie Railroad Co., with headquarters at Pittsburgh.

♦

David T. Marvel has been appointed manager of tube sales for Timken Roller Bearing Co., Canton, O. He will have charge of all forms of Timken seamless steel tubing.

♦

G. C. Krueger has been appointed district manager at Chicago for Jessop Steel Co., Washington, Pa. He has been associated with the company for a number of years as a salesman in the Chicago and Milwaukee territory.

♦

Henry J. Mokate, associated with subsidiary companies of United States Steel Corp. since 1920, has been named manager of sales of the new secondary products division of Carnegie-Illinois Steel Corp., Pittsburgh, with headquarters there.

♦

J. E. Duffy, assistant manager of the Cleveland branch of Crane Co., the past ten years, has been made manager, succeeding the late W. K. Glen. Mr. Duffy went to Cleveland from the general office of Crane Co., Chicago, in 1922 as a district representative.

♦

Rufus E. Zimmerman, vice president of research and technology, United States Steel Corp., has been awarded the degree of doctor of science by Franklin and Marshall college, Lancaster, Pa., from which he was graduated in 1908 with a Ph. B. degree.

♦

Earl M. Richards, assistant to vice president in charge of operations, Republic Steel Corp., Cleveland, and D. F. Carpenter, director of manufacturing, Remington Arms Co. Inc., Bridgeport, Conn., were among the new directors elected at the annual business meeting of the American Management association in New York, June 2. Raymond S. Perry, vice president, Ingersoll Milling Machine Co., Rockford, Ill., was elected vice president, production division.

Jack B. Dale

Elected president, Southern Supply and Machinery Distributors' association, as noted in STEEL, May 16, page 27. He is president, Briggs-Weaver Machinery Co., Dallas, Tex.

♦

Howard G. Warwick has been appointed exclusive representative in Illinois and eastern Wisconsin for the Sheet Aluminum Corp., Jackson, Mich. He recently was associated with E. C. Faulkening under the firm name of Warwick Steel Co., with offices at Chicago and Milwaukee.

♦

J. L. Whitten, formerly manager of the steel division, Brown Instrument Co., Philadelphia, has been appointed sales manager, Lee Wilson Engineering Co., Cleveland.

C. H. Carpenter, associated with Wilson organization about two and a half years, has been named chief engineer.

♦

Harry W. Holt, vice president and sales manager, Bohn Aluminum & Brass Corp., Detroit, has resigned as an active executive of that company. He continues as a director. Mr. Holt had been with the Bohn corporation since its formation in 1918, having served in both production and sales executive capacities.

♦

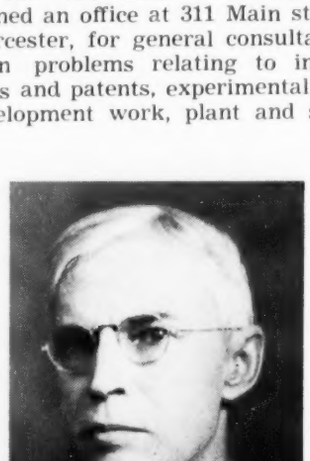
Wesley P. Sykes, metallurgical engineer, Cleveland wire works, General Electric Co., has been awarded the honorary degree of doctor of engineering by Case School of Applied Science, Cleveland. He was graduated from Case with the degree of bachelor of science in metallurgy in 1916.

♦

Thomas E. Millsop, president, Weirton Steel Co., Weirton, W. Va., division of National Steel Corp., has recently had conferred upon him by King Victor Emanuel III of Italy the honorific title of Knight of the Crown of Italy. Mr. Millsop was selected for this decoration because of distinguished service as captain in the army aviation corps during the World war and for important accomplishments in industrial and social fields since the war.

♦

George D. Hartley, who, with the late Frank H. Sleeper, organized Sleeper & Hartley, Worcester, Mass., and for many years was treasurer, general manager and sales manager of that company until his retirement in 1936, has opened an office at 311 Main street, Worcester, for general consultation upon problems relating to inventions and patents, experimental and development work, plant and shop



G. D. Hartley

surveys, management and personnel, designing and building equipment and machines, and domestic and foreign sales.

♦

John E. Shock has been made plant superintendent, Mercer Tube & Mfg. Co., Sharon, Pa., succeeding George L. Hise, resigned.

♦

W. T. Schaup has been appointed service engineer by Basic Dolomite Inc., Cleveland, with headquarters at 1714 Keystone Hotel building, Pittsburgh. He began his career in 1891 as a messenger boy with the former Carnegie Steel Co. In 1895 he was transferred to the open-hearth department where he served as senior melting foreman 14 years and later as assistant open-hearth superintendent two years. Subsequently he became associated with Midvale Steel & Ordnance Co.,

W. T. Schaup

Wheeling Steel Corp., Inland Steel Co., Crescent Fire Brick Co., and Pittsburgh Crucible Steel Co. In 1927 he went with the Canadian Refractories Co., Montreal, Que., handling Basifrit and "695" plastic products. He is now serving plants with these same products as well as other products of Basic Dolomite.

♦

Benjamin F. Fairless, president, United States Steel Corp., is now a Kentucky colonel. In behalf of Gov. A. B. Chandler, the commission recently was presented to Mr. Fairless by Harry Moses, president, United States Coal & Coke Co., subsidiary of the Steel corporation, who also is a Kentucky colonel.

♦

Anders G. Ericson has been made chief engineer, and Arthur V. Wiebel, assistant chief engineer at the Homestead, Pa., works of Carnegie-Illinois Steel Corp. Mr. Ericson, who succeeds A. W. Soderberg, retired, joined the United States Steel

G. P. Howell

Who has been named district manager of the strip steel division for Acme Steel Co., Chicago, in the Wisconsin and Upper Michigan territory, as noted in STEEL, May 16, page 30. His headquarters are in the Guaranty building, Milwaukee

Corp. organization at Homestead in 1924 and has been assistant to chief engineer since 1935. Mr. Wiebel joined the company in 1933, and since 1937 has been on the engineering staff in Pittsburgh.

DIED:

■ H. W. SEYMOUR, 64, vice president in charge of sales, Crane Co., Chicago, from 1929 until his retirement April 1, 1938, in Washington, June 2. Mr. Seymour joined Crane Co. in 1905 at the Baltimore branch. He later was made manager of both the Baltimore and Washington branches and in 1925 went to Chicago as general manager of sales.

♦

Ernest Burkhardt, 79, president, Burkhardt & Sons Steel & Iron Co., Denver, in Denver, May 29.

♦

Charles I. Miller, 55 hoisting engineer, Industrial Brownhoist Corp., Bay City, Mich., in that city, May 29.

♦

Byron H. Edwards, 70, president, Ideal Furnace Co., Detroit, in that city, May 30.

♦

L. J. Tavener, 47, American representative of International Tin Research and Development council, in Montclair, N. J., May 29.

♦

Samuel S. Fair, 64, president, Valley Steel Castings Co. and a prominent business man in the Saginaw-Bay City territory in Michigan, May 31 in Ann Arbor, Mich.

♦

John Alexander Campbell, 81, chairman of the board, Trenton Potteries Co., Trenton, N. J., a subsidiary of Crane Co., Chicago, at Trenton, June 2.

♦

Sol Morrison, 74, prominent in the scrap iron business for about half a century and president, Morrison-Risman Co., Buffalo, in that city recently.

♦

Arthur H. Beeman, 62, Michigan and Ontario district sales representative for the Ironton Fire Brick Co., Ironton, O., at his home in Windsor, Ont., May 21.

♦

Henry T. Cole, 68, chairman of the board, United States Radiator Corp., Detroit, in Detroit, June 7. He became chairman in 1936 after serving as president for 15 years, and vice president and treasurer for 11.

♦

S. E. Conybeare, 53, general manager, industrial division, Armstrong Cork Co., Lancaster, Pa., and former president, Association of National Advertisers, at Lancaster, June 1. He joined the company in 1915.

♦

Harry E. Harvey, 54, vice president, Standard Tube Co., Detroit, at his winter home in St. Petersburg, Fla., June 7. Born in Rockport, Conn., Mr. Harvey went to Cleveland in 1924 to become supervisor for Steel & Tubes Inc., a post he held until his resignation in 1930 when he joined Standard Tube.

♦

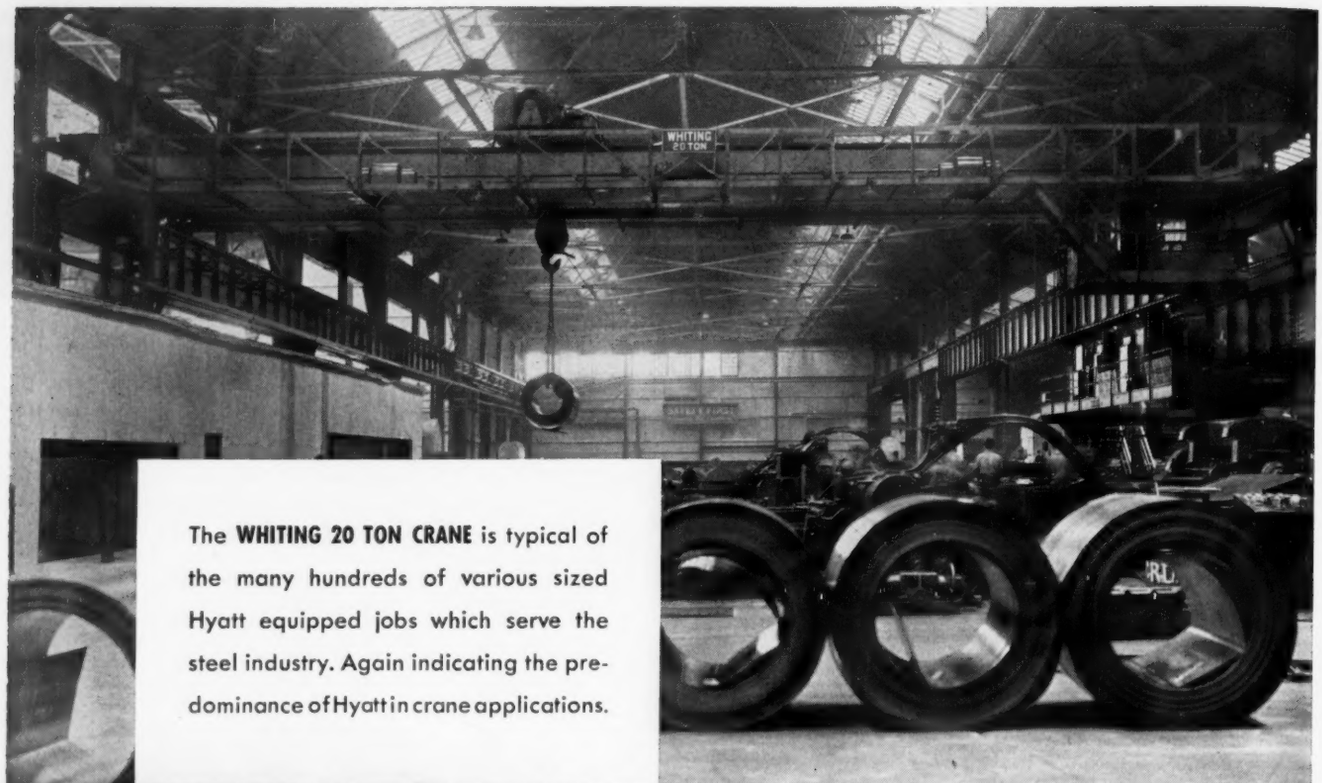
Charles S. Wilcox, 82, chairman of the board, Steel Co. of Canada Ltd., Hamilton, Ont., in Hamilton, June 6. He had been president of the old Ontario Rolling Mills in that city and became a director of the company when a merger of five firms resulted in the formation of the Steel Co. of Canada.

♦

Daniel F. Rogers, 62, consulting engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, in Atlanta, Ga., May 30. Associated with Westinghouse 40 years, Mr. Rogers for a time was district engineer in charge in New York, and later served 25 years as district engineer in charge of the southeastern district.

♦

Harrison Souder, 67, consulting and mining engineer, at his summer home in Duxbury, Mass., May 31. From 1916 to 1927 he was general manager of the Cornwall, Pa., division of Bethlehem Mines Corp. During his career he examined iron ore and fluorspar mines for Bethlehem Steel Co., was superintendent of construction of a dam at Johnstown, Pa., for Cambria Steel Co. and inspected iron and manganese ore deposits in many parts of the world.

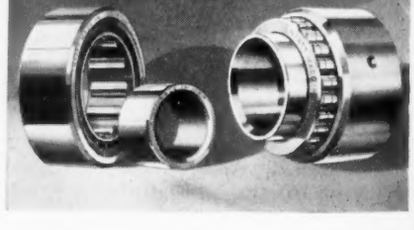


The **WHITING 20 TON CRANE** is typical of the many hundreds of various sized Hyatt equipped jobs which serve the steel industry. Again indicating the predominance of Hyatt in crane applications.

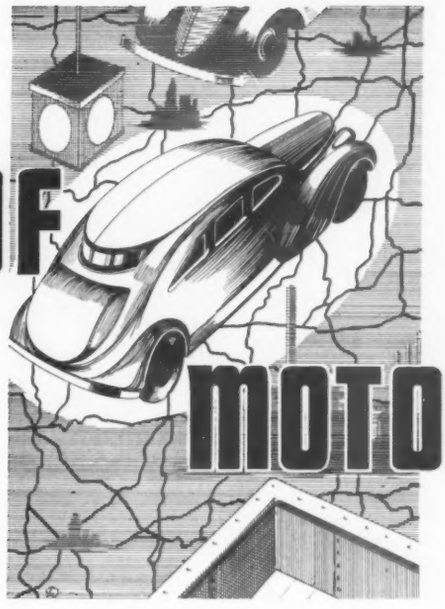
MORE *Hyatts* ... MORE *Economy* ...LESS DEPRECIATION

BECAUSE they run so smoothly for so many years in so many assignments, Hyatt Roller Bearings usually mean better designed, longer-lived, more dependable operating equipment. And one of the main reasons for the widespread use of Hyatts is their economical performance—economy that reaches right back to the source of power — because friction is practically eliminated, and wear is negligible. Built for endurance ... for tough going ... for heavy loads ... Hyatt Roller Bearings withstand punishment that would make ordinary bearings old before their time. Designed right, built right, and applied right, Hyatts assure longer, economical operation wherever they serve. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT *Roller Bearings*



MIRRORS OF MOTORDOM



DETROIT

■ THROTTLE on new model activity has been opened another notch, and hungry tool and die shops are pushing in to get their share of impending work. In view of the low ebb of trade in this field, some rather attractive prices are noted on the few releases which automotive companies are making.

Peak of this business is not expected until July and August, but a number of contracts have been placed for hoods, running boards, fenders and the like.

In these few preparations for new models is about the only ray of hope at the moment. Elsewhere the picture continues black—even gloomier than during the somber days of 1932 and 1933. Assemblies continue to ease off, and reports are again heard of summer-long shutdowns.

To offset this murky outlook among the large producers of automobiles, there are signs of scattered improvement among smaller industries, some of them not directly connected with automobiles.

Some Small Shops Busy

It is not unusual to find an occasional small shop with all the work it can handle, a condition probably resulting from the fact small shops will take in jobs which are so small as to be unprofitable for the larger plant. Where it is possible to bulk enough of these small orders, good operations result, and steel sellers here can point out at least a few customers in this situation.

One leading steel company reports orders so far in June ahead of the same period last month. Perhaps this meager improvement in operations among smaller shops may be the bellwether of a general rise in business which is difficult to discern through the fog of pessimism encountered nearly everywhere locally.

Among changes in prospects for

BY A. H. ALLEN
Detroit Editor, STEEL

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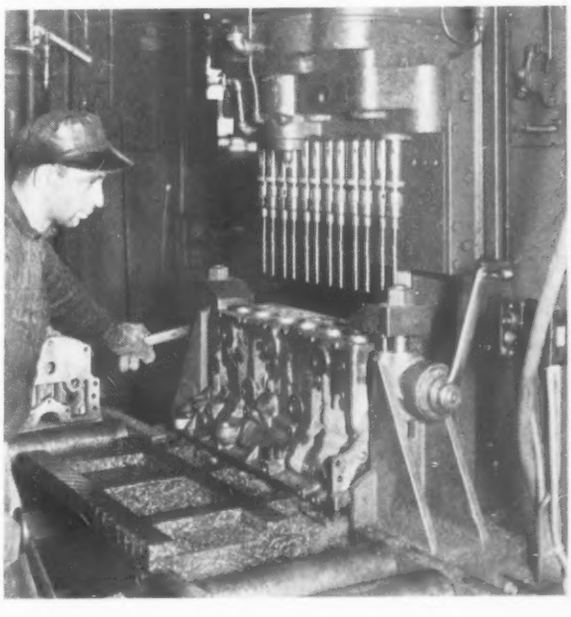
1929 is a return to coil springs and independent suspension of front wheels by Dodge and Plymouth. These makers had this type of suspension on 1932 models, a year later offered coil springs on deluxe models only (extra cost on standard models). For the past two years, extensive tests have been carried out on a new system scheduled to appear on 1939 models.

This switch, plus the fact Buick has been having success with its rear coil spring design, has given rise to speculation over whether other builders may be scouting the possibilities of extending coils to all four wheels. Plymouth has put a test car so equipped through routine field tests, but no indication of any proposal to place the system in production is heard, the reason no doubt being that too many changes would be required in the chassis.

Mention of springs brings up consideration of the new Firestone Steel Products Co. plant in this area which is now practically ready for production. The plant originally was scheduled to make rims and air springs, the latter line being dependent on adoption of air springs by some automobile builder. As far as is known now, no producer has ventured into this field, but it is

Gang Drilling Valve Stem Guides, Tappet Holes



■ **Valve stem guides and tappet holes are gang drilled with a new type machine on the De Soto cylinder block line, a preliminary operation to final drilling and finishing steps**

possible consideration is being given the matter. A Buick equipped with air springs is being driven around town by engineers.

Increasingly disturbing to a number of parts suppliers is the steady trend toward integration of facilities of car builders. As mentioned in these columns before, the larger units of the industry are constantly reaching out to bring into the fold production of many parts, stampings being typical. A battery of new heavy presses is now going into the De Soto stamping division which already houses over 80, ranging from small high-speed inclined presses to the huge giants for steel top and fender fabrication.

A considerable volume of Chrysler stamping work is being brought into the Wyoming avenue plant, and if 1939 production does not run beyond present estimates, the outside "fender benders," as the stamping people often are labeled, will find lean pickings in the next eight months. Of course, there is always some business for outside suppliers, but the downward trend has been accentuated by decreased automobile production.

■ HARD on the heels of Ford's announcement of a new cab-over-engine truck model, Chevrolet and Dodge have introduced similar units with bodies built by Montpelier Mfg. Co. The Dodge model is made in both 1½-ton and 2-ton chassis, and provides 28 inches additional loading space in the same wheelbase. The Chevrolet design is offered on three wheelbases on the 1½-ton chassis.

With these new models, the cab-over-engine field is fairly well covered from light to heavy tonnage ranges. A mounting number of buyers in the commercial field are specifying this type of vehicle. Incidentally, Federal has reduced prices of its cab-over-engine models from $35 to $60.

General Motors truck division is putting the finishing touches on its new engine plant in Pontiac which has been equipped for engine production at a reported cost of $2,000,000. The plant, it is understood, will absorb truck engine building formerly carried out by Oldsmobile and Pontiac, whether all such power plants or only the smaller units is not known.

■ AN INTERESTING chart has been compiled by *Ward's Automotive Reports* showing the percentage loss of individual car builders in sales for the first three months this year compared with the same period last year. For the light it throws on competitive position of the various makers and how they have withstood the recession's attack it is of considerable value. In substance the report shows:

	% Loss over 1937		% Loss over 1937
Buick	6.0	De Soto	50.3
Chevrolet	32.4	Packard	50.8
Cadillac	34.1	Studebaker	51.6
Chrysler	46.0	Ford	52.4
Oldsmobile	46.1	Plymouth	58.2
Pontiac	48.0	Hudson	61.5
Nash	49.2	Dodge	64.9

These figures may be related to official department of commerce totals for production in the first three months of the two years which show a decline of 51.1 per cent for this year as against last.

■ FEARS have been expressed over the future of the great middle class of people in the country, the so-called "stable belt" of America. A recognized controlling majority, nevertheless this group gets scant attention from a government swayed by organized pressure groups. Gen. Hugh Johnson in a recent address suggested possibility of this group swinging away from Big Business and the New Deal into the ranks of radicalism. The same idea has been peddled here by a prominent labor leader.

Within the last few weeks has been born the Middle Class Alliance Inc., under the direction of Cliff Knoble, a former Chrysler advertising man, and now head of a Business Promotion Corp. He cites figures to show 5 per cent of the nation's people in the "big money" class, 30-35 per cent in the laboring class, leaving an emphatic majority of 60-65 per cent belonging to neither of the two minor groups which more or less have been at war since advent of the CIO. And in this war, it has been the middle class which has had practically no voice and has suffered as a consequence.

Mr. Knoble now has 26 solicitors selling memberships at $3 each in the organization which, incorporated under the laws of Delaware, seeks to "cure many economic ills by asserting itself in legislative matters." Already 1000 have been signed out of a local goal of 50,000. As one accomplishment, Knoble sees the possibility of pressure from his group bringing about legislation which would make arbitration of labor disputes compulsory.

Meanwhile Detroit is weighing the toll of labor disputes which, in 1937, according to the department of labor, cost the city 2,400,000 man-days in 178 strikes. Lost time was the highest here of any city in the country, while the "manufacture of transportation equipment, chiefly automobiles and parts" led all other industries with 4,721,000 man-days of work lost. Michigan was second only to Ohio in the number of man-days' work lost—3,925,000 against 3,938,000. Total lost time for the country for the year was 28,425,000 days.

■ FROM the publicity mills: Volume of service and parts business by Pontiac dealers for the first three months of the year is up about 18 per cent over last year. . . . Buick reports black cars constitute majority of exports as far as color is concerned; also that China is regarded as the largest undeveloped automotive market in the world. . . . Graham is building up a separate division to handle tractor sales, has appointed E. J. Harrington as sales manager, who will proceed to strengthen dealer organization. . . . Donald Richberg, Louis G. Hines and Bennett Chapple will bat for government, labor and industry, respectively, at a conference on recovery problems sponsored here by the Detroit Industrial Advertisers association Tuesday. . . . Rosy future for the light-weight alloys in automobiles is seen by C. B. Bohn of Bohn Aluminum who predicts improvements in efficiency "almost beyond present comprehension." . . . Oldsmobile is preparing for a summer influx of buyers who will take delivery of their cars at the plant, 12,000 doing so last year. . . . Buick will sponsor broadcast of the Louis-Schmeling fight again June 22 on both networks of NBC. . . . Willys-Overland has reduced factory expense and salaries 25 per cent below the level of October, 1937. As of March 13, Willys assets stood 3.3 to 1 over liabilities. . . . $2400 is the price tag on a Pontiac 8 in Australia.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
April	527,625	553,231	238,133
4 mos.	1,644,622	1,855,339	907,502
May	480,518	540,377	*210,000
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Week ended	
May 14	47,415
May 21	46,810
May 28	45,120
June 4	26,980

(Production figures for the week ended June 11 will be found on page 21.)

WINDOWS OF WASHINGTON

WASHINGTON

■ THE SENATE last Thursday passed the bill providing for appointment of a commission to be charged with investigation of the antitrust situation, in accordance with a recent message of the President.

The President asked congress for some such body which will make certain recommendations relative to strengthening and enforcing antitrust laws. The resolution as reported provides an appropriation of $500,000 for the study.

The bill provides for forming a commission consisting of three members of the senate, to be appointed by the vice president, three members of the house, to be appointed by the speaker and one representative each from the departments of justice, treasury, commerce, federal trade commission and securities and exchange commission.

The plan is for the new commission to make the study and submit its findings in a report to be submitted to congress during the next session which would include the following:

"1. Causes of such concentration and control and their effect upon competition.

"2. Effect of the existing price system and the price policies of industry upon the general level of trade, upon employment, upon long-term profits and upon consumption.

"3. Effect of existing tax, patent and other governmental policies upon competition, price levels, unemployment and consumption."

BUSINESS SORELY PENALIZED BY INCONSISTENT POLICIES

Business interests are becoming more disturbed over Washington's trends, according to information received by the United States Chamber of Commerce. In commenting

BY L. M. LAMM

Washington Editor, STEEL

on the attitude of the country's business in this connection, the national chamber says:

"They are puzzled about what appears to them to be contradictions and inconsistencies in policies and methods.

"They are wondering if Washington is so intent on reshaping the traditional American economic system that it may not be overlooking practical measures to promote recovery.

Fear Colossal Tax Load

"Business men see additional billions of dollars spent with the purpose of reviving trade and industry; at the same time, more millions allotted to finance construction of power plants to compete with existing private facilities.

"They are wondering if the practical and psychological benefits of the new tax law will not be lessened by official insistence on restoring the punitive higher rates of the discredited surplus tax and a steeply graduated capital gains tax in the next session of congress.

"They are mindful that the ten billion dollars, authorized or appropriated by the general congress (nearly twice the estimated revenues for the coming year) will eventually mean higher taxes on business, already carrying a staggering tax-load.

"They are wondering whether the proposed investigation of the antitrust laws will not turn out to be another business-baiting expedition, rather than develop into an earnest effort to correct defects in these laws so that fair competition can be assured.

"They are wondering about the circumstances of indictments of distinguished and reputable leaders in industry on vague charges of antitrust law violations.

"They are fearful that the fixing of wages and hours by legislative fiat, as proposed in the pending labor standards bill, will have a detrimental effect on recovery and may, inevitably, lead to complete regimentation of industry.

"They are at a loss to understand delay in amending the national labor relations act so as to give both employer and employe a square deal.

"These are some of the Washington factors confounding business men and making it difficult for them to make commitments that would assure a greater number of permanent jobs and bigger payrolls than the government, with its huge spending program, can hope to provide.

"Business men are whole-heartedly trying every practical device to prevent further unemployment and to bring enduring recovery. Individually and collectively they are applying themselves unreservedly to the task of trying to find the way out."

BIGGERS GIVES FIGURES ON STEEL EMPLOYMENT

John D. Biggers, administrator of the national unemployment census, has made a final report on the industrial distribution of persons who registered as totally unemployed or as emergency workers.

It is pointed out in a statement by Mr. Biggers that the iron and steel industry, including blast furnaces, steel rolling mills and other iron and steel producers, show 408,737 registrants, and is one of the industries which he points out as especially significant in its proportion of unemployment.

In connection with the unemployed, including emergency work-

ers in blast furnaces and steel rolling mills, there was a total of 82,226, of whom there was a registration of 81,049 males and 1177 females. A total of 69,138 registered as totally unemployed in these plants, 68,040 males and 1098 females. Also 13,088 registered as emergency workers, of whom 13,009 were males and 79 females.

Under the heading of "other iron and steel industries," 326,511 registered as unemployed, including emergency workers, of whom 315,070 were males and 11,441 were females. Registration for totally unemployed was 262,427 of whom 251,595 were males and 10,832 females. In these plants also, emergency workers unemployed totaled 64,084 of whom 63,475 were males and 609 females.

In the compilation it is pointed out that 620,894 gainful workers were employed in blast furnaces and steel rolling mills in 1930, of whom 602,358 were males and 18,536 females. In the same category of gainful workers of 1930 "other iron and steel industries," there was a total of 1,763,910, of whom 1,655,044 were males and 108,866 females.

BLACKLIST OF VIOLATORS OF LABOR ACT PROPOSED

A report has been made by the house committee on the judiciary recommending passage of an amendment to the Walsh-Healey act.

As provided by the committee, the principal changes contemplated are the extension of the scope of the act to all government contracts in excess of $2000. The present limit is $10,000. It would also include contracts for services and vessels and would place on an ineligible list bidders who are in violation of the national labor act. The other proposed amendments are chiefly of a technical character.

One of the sections of the new bill requires the procurement division of the treasury department to distribute to purchasing agents of the government a list of those who have violated the labor act. It is provided that the certification will make it impossible for violators of the labor act to obtain further government business for three years.

SEEK NAVAL DESIGNS TO FIT ASSEMBLY LINE

Rear Admiral William G. Dubose, chief of naval construction, appearing before a subcommittee of the house in connection with a $52,000,000 additional appropriation, stated that the proposed "mystery" fleet will consist, at the present time, of eight vessels, two types of subchasers and two types of fast torpedo boats.

Admiral Dubose told the committee, in asking for $4,500,000 for experimental ships, that the navy had decided, for the present at least, to build two 110-foot wood subchasers, two 165-foot steel subchasers, two 70-foot motor torpedo boats and two 54-footers, all during the coming year.

The committee was told that competition will be conducted among private boat builders for designs to be compared with those which the navy has already worked out. Admiral Dubose explained that the navy is anxious to develop satisfactory craft of these types so that in a national emergency they could be produced speedily in large numbers by private industry.

It will be recalled that the naval expansion bill authorized $15,000,000 for experimental work which the committee is told will probably be spent over a five-year period.

CIVIL LIBERTIES UNION TAKES EMPLOYER'S SIDE

Probably for the first time in its existence the American Civil Liberties Union has taken sides with employers. The organization through its counsel, Arthur G. Hayes, has sent a letter to the labor relations board asking it to clarify the employer's right of free speech.

"In the event that the labor relations board or the courts attempt to restrict freedom of speech of employers, when the same constitutes an expression of opinion which does not amount to a direct threat or an act of coercion, the Civil Liberties Union will be alert to come to the defense of such employers."

Mr. Hayes asked permission to present arguments to the board, urging clarification of a section of its order against the Ford Motor Co.

The Civil Liberties Union expressed general approval of the order against the Ford company, however, on the ground that "sufficient evidence of illegal interference justified the finding that the company is guilty of unfair labor practices."

COMMISSION HAS BIDS FOR REPAIRS TO LINERS

The United States maritime commission has received the following bids for the reconditioning of the liners VIRGINIA, CALIFORNIA, and PENNSYLVANIA, which are to be placed in the new service the commission will establish between New York and the east coast of South America on or about Sept. 1:

Bethlehem Shipbuilding Corp., New York, $338,000 for any one of the three ships; $685,000 for any two of the three ships.

Robins Dry Dock Co., Brooklyn, N. Y., subsidiary of Todd Shipyard Corp., $296,000 for the PENNSYLVANIA.

Atlantic Basin Iron Works, Brooklyn, N. Y., $272,001 for the CALIFORNIA; $282,600 for the VIRGINIA; or $554,601 for both.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., $307,000 for the CALIFORNIA; $311,000 for the PENNSYLVANIA; $310,000 for the VIRGINIA; $618,000 for the CALIFORNIA and the PENNSYLVANIA; $617,000 for the CALIFORNIA and the VIRGINIA; $621,000 for the PENNSYLVANIA and the VIRGINIA.

MARITIME COMMISSION TO SUBSIDIZE DOLLAR SHIPS

Emory S. Land, chairman of the United States maritime commission, has announced that the commission has authorized a five-year operating subsidy contract carrying an annual subsidy of approximately $3,000,000 to the Dollar Steamship Lines Inc., San Francisco.

To assist the financial rehabilitation of the company, the commission also has agreed to advance $1,500,000 for reconditioning and repairing the fleet of 13 vessels covered by the subsidy contract.

Furthermore, he stated, the commission has assented to rearrangement of present indebtedness to the commission amounting to $7,474,193.94 to enable the company to obtain a loan of $2,000,000 for working capital from the reconstruction finance corporation. The R.F.C., he said, has authorized this loan.

Completion of the transaction is subject to acceptance by the company and associated interests in the Dollar organization of the terms and conditions under which the subsidy contract and advances were authorized by the commission and the R.F.C.

SURVEY OF SALES SHOWS MOST STEEL FOR GOVERNMENT

A story has been circulated in Washington the past few days, which cannot be authenticated, to the effect that the President has recently expressed considerable surprise over a study said to have been made recently by a government economist.

The story is to the effect that this survey was of new orders received by the steel industry, and that an analysis shows that nearly three-fourths of the orders were for government work. The story does not indicate who made the study or when it was made.

JAPAN TAKES TIN SCRAP

During May, according to an announcement from the state department, eleven licenses were issued for export of tin plate scrap. The country of destination in all cases was Japan, and the amount was 674 long tons valued at $13,236.

Fair Trade Laws Provide Means To Curb Selling Abuses; Few Producers Use Them

■ FOR many years manufacturers have dreamed of maintaining their resale prices and have urged legislation by which the terms of resale contracts might be enforced.

Now that fair trade laws prevail in 43 states, not to speak of the Miller-Tydings act, why do not more manufacturers of trade-marked or branded products avail themselves of the provisions of these laws?

In his interesting article on this subject in last week's issue of STEEL, George A. Fernley, secretary-treasurer, National Association of Sheet Metal Distributors, listed the chief reasons why more manufacturers do not take advantage of these laws.

"They wish someone else to do the pioneering and experimenting. They are of the opinion that it is expensive, cumbersome and unwieldy to enter into contracts with distributors in 43 states. They are fearful that it will place them in an unfavorable competitive situation. Distributors generally have not as yet indicated that they want such contracts executed."

These are the four main reasons, according to Mr. Fernley, why appeals for relief against resale price violations are not made more frequently.

Courts Upholding Provisions of State and Federal Safeguards

To date, some 55 to 60 manufacturers have taken action under the fair trade laws. The decisions manifest a disposition on the part of the courts to uphold these laws and provide ample relief under their provisions.

A manufacturer cannot sell to retailers direct at prices lower than his minimum price on resales by wholesalers to retailers, according to one decision. A distributor has the right to enter suit against another distributor for cutting resale prices, according to another.

A purchaser may not sell to its employes at a discount which makes the net price lower than the minimum resale price, according to one decision. Prices fixed for resale by retailers must be uniform in any one competitive area, according to another. A resale price contract, according to another, may provide a standard of determination for trade-in allowances.

These are only a few of the contractual rights which have been found enforceable under these laws. While the decisions so far made are relatively few in number they have been the subject of close study by manufacturers and distributors with the result that violations of resale contracts are fewer in number and the market on trade-marked and branded goods is more stable.

Ample Remedy for Manufacturer Against Resale Price Violation

A strange quirk in human nature is the tendency to countenance price cutting even when the manufacturers and distributors involved are quick to admit that such price cutting frequently leads to a market condition that is bad for all concerned.

Even during the NRA period of fixed prices many manufacturers were unable to resist the temptation to obtain temporary sales advantages by resorting to price cutting, even though they subsequently were assessed heavy fines in punishment of such infractions of the code provisions.

Slowly building up under the fair trade laws is a code of permissible business practices in the distribution of trade-marked and branded products. Even now the interpretation of these laws has advanced to a point where the manufacturer whose resale prices are being violated has only himself to blame.

Holiday Interruption Reflected in Activity Index

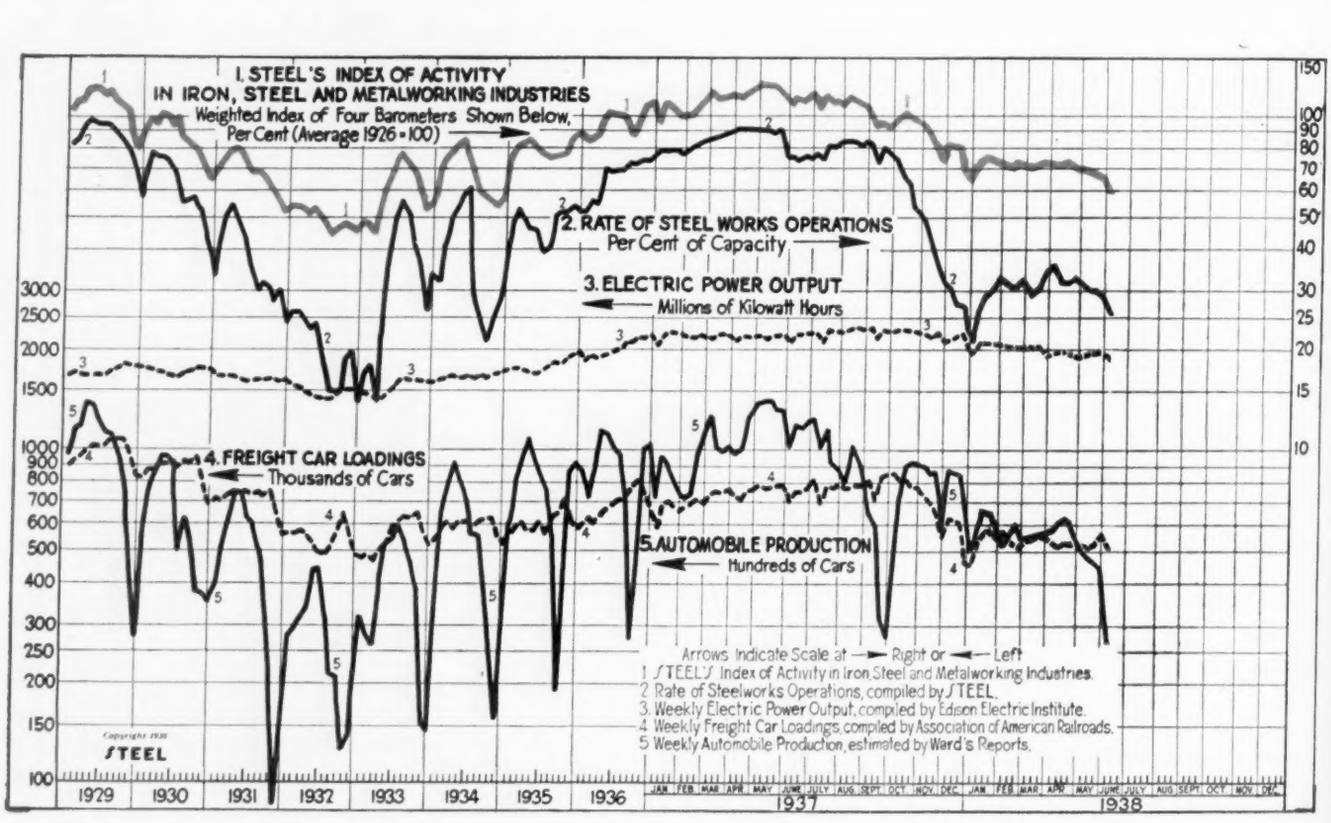
■ RECORDS of business for the week ended June 4 were affected by interruptions for the observance of Memorial day. Due to this factor and the more than seasonal easing in automobile production and steelworks operations, STEEL'S index of activity declined 8.3 points to 58.2.

The decline of 18,140 in automobile assemblies was accentuated by a week-long shutdown of almost all Ford plants. Some rebound from the low levels of the holiday week is expected. Automobile output of 26,980 units in the week was the lowest since the week ended Oct. 3, 1936.

The rate of steel ingot operations dropped from 28.5 per cent to 25.5. This was the lowest for any full week this year.

Revenue freight carloadings declined to approximately 507,541 cars in the week ended June 4, caused primarily by the holiday interruption. In the preceding week freight traffic registered an increase of 16,253 cars, top of a three-week advance.

Electric power consumption eased to 1,878,851,000 kilowatt-hours, a new low level for this year after registering moderate gains in the four preceding weeks. This is the lowest this barometer has been since the week ended March 28, 1936.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 = 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at — Right or — Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 8.3 points to 58.2 per cent in the week ended June 4:

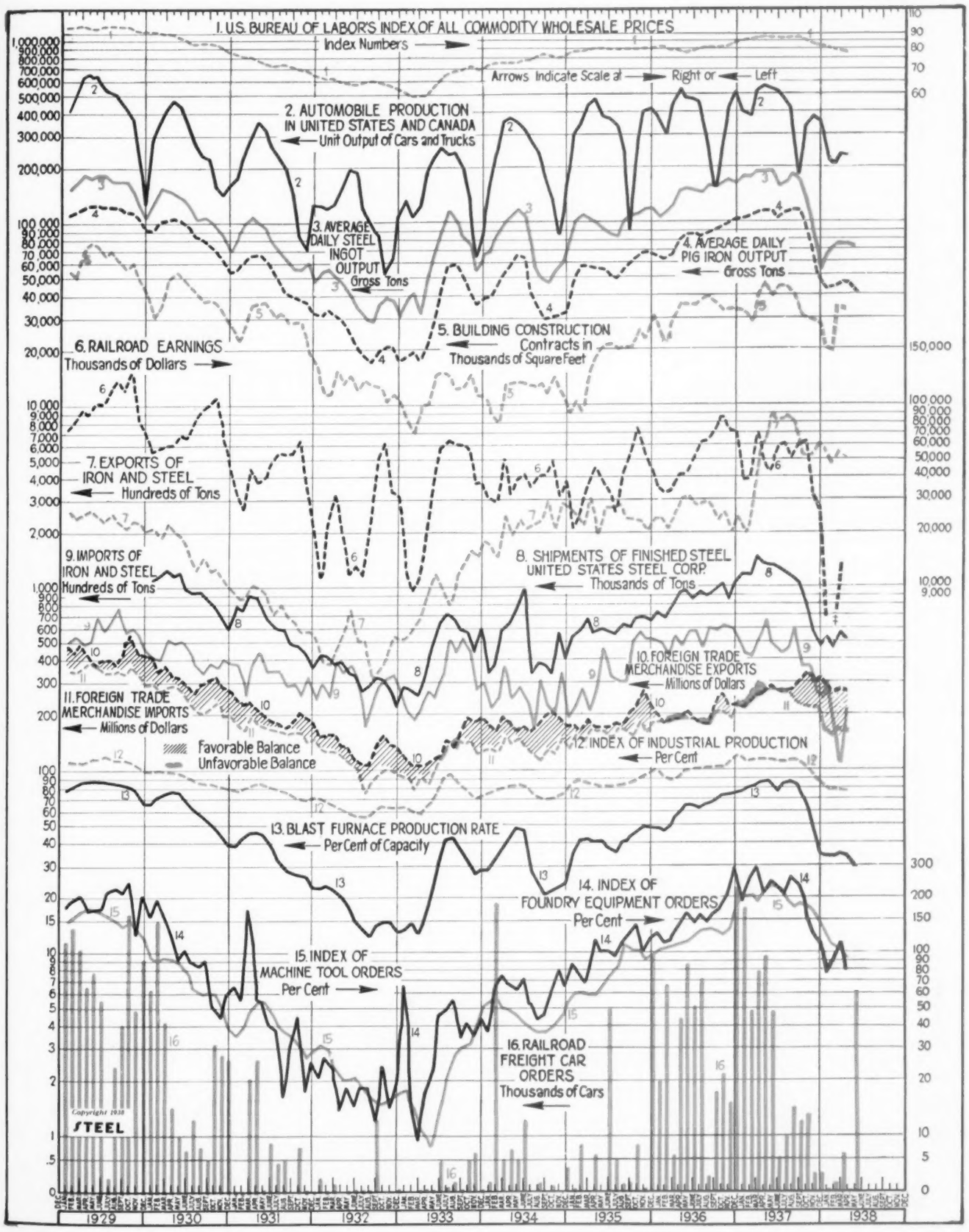
Week ending	STEEL'S Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8	112.7	30.0	87.0	2,014	2,212	556,664	748,993	57,438	101,684
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4	114.0	35.0	90.0	1,975	2,200	572,952	761,109	56,800	101,046
Apr. 2	72.0	112.0	36.0	91.5	1,978	2,146	523,489	726,687	57,500	97,005
Apr. 9	71.3	112.8	32.0	91.5	1,990	2,176	521,978	716,044	60,975	99,196
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767	761,182	60,563	133,164
Apr. 30	68.4	123.9	32.0	91.0	1,938	2,193	543,075	782,423	50,755	139,475
May 7	68.5	123.5	31.0	91.0	1,939	2,176	536,140	767,481	53,385	140,188
May 14	67.2	123.2	30.0	89.0	1,967	2,194	541,813	773,669	47,415	140,396
May 21	67.1	122.2	30.0	91.5	1,967	2,198	545,808	779,276	46,810	131,306
May 28	66.5†	115.6	28.5	75.0	1,973	2,206	562,061†	794,855	45,120	131,421
June 4	58.2*	105.1	25.5	75.0	1,878	2,131	507,541*	692,140	26,980	101,629

*Preliminary. †Revised.

STREND

Key:	April, 1938	Key:	April, 1938	Key:	April, 1938	Key:	April, 1938
1	78.7	5	32,569,000	9	21,237	13	29.4†
2	238,133	6	*14,470,444‡	10	274,482,000	14	79.3
3	72,272†	7	489,202	11	159,907,000	15	91.0
4	40,675†	8	501,972	12	77.0	16	6,014†

*March. †May. ‡Deficit of $2,136,481 in February not shown on chart.



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

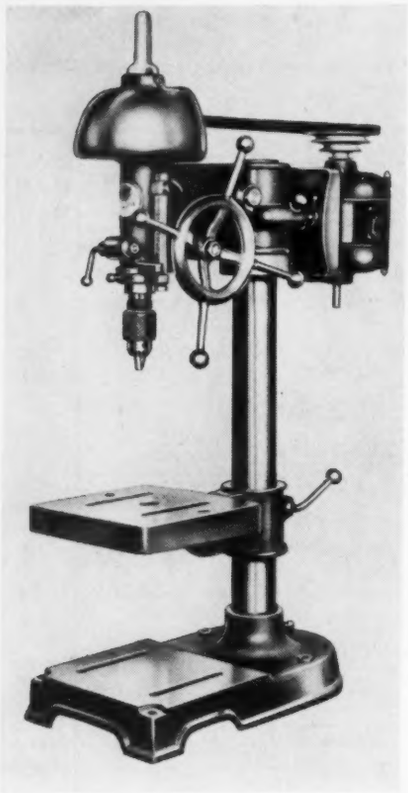


Fig. 1—In this 155-pound standard drill press are incorporated the elements for numerous special tools

Machining Die Co

Toledo manufacturer effects tremendous savings by devising ingenious special production line tool set-ups from elements of standard light machine tools

■ A VIRTUE of the zinc alloy die casting process is that it produces direct from molten metal parts requiring a minimum of machining — parts which come from the die smooth of surface, precise in detail, and as intricate as desired. Frequently, however, after casting a hole must be drilled, a connection tapped, a seat faced, or a bore reamed. These are light and incidental machining operations, to be sure, but they are important from a cost standpoint when production runs are large.

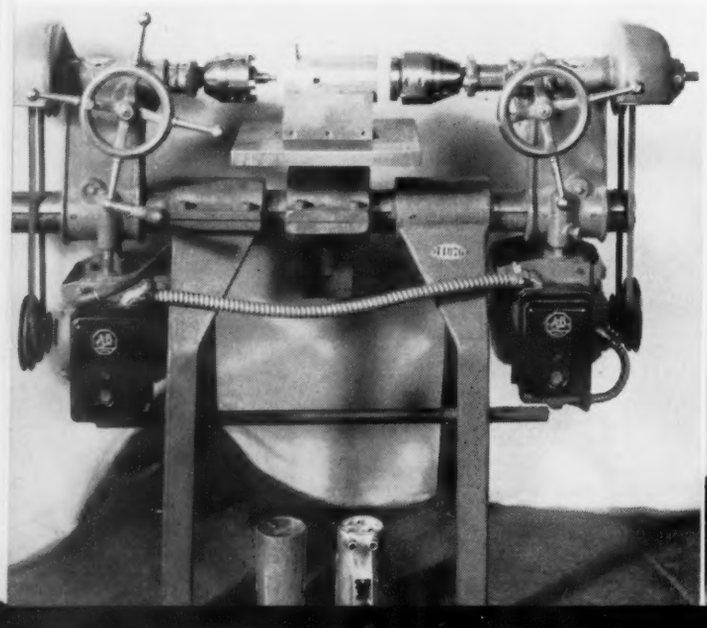
Producers and users of zinc alloy die castings recognize that the die casting process eliminates the need for most machining, and that the zinc die casting alloys are free cutting and easy to machine when necessary. However, perhaps few realize how much can be done, in many cases, by way of reducing the ultimate cost of die castings through ingenious methods of tooling up for whatever machining must be done. Often, thoughtful planning for "drilling that row of little holes along the edge," or some similar operation, saves real production money.

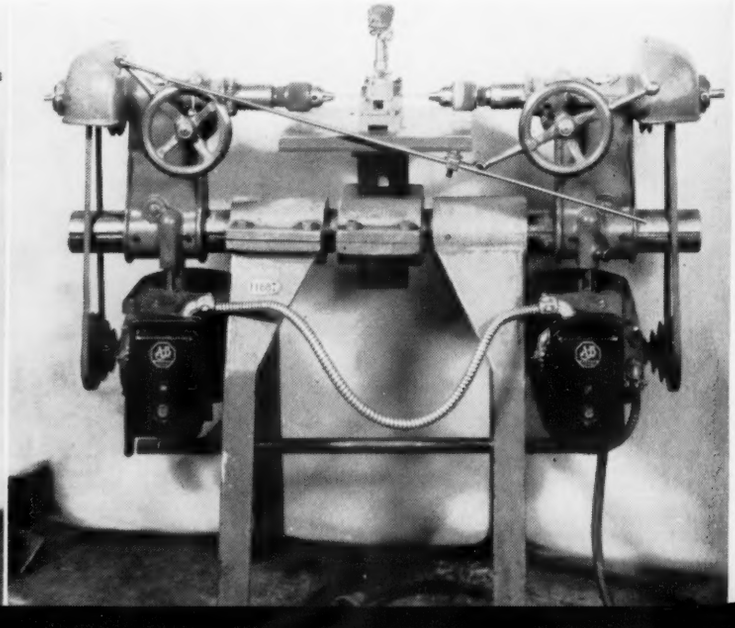
Set-ups Prove Economical

In this connection, Doehler Die Casting Co. has devised several amazingly economical machine tool set-ups at its Toledo, O., plant. These installations illustrate admirably economical methods of tooling up and may give other manufacturers a clue to sensible and ingenious means of paring the expenses of putting finishing touches on zinc alloy die cast items.

Machine tools are required to do production machining, and, where the only operations to be performed are light drilling, tapping, threading, facing, reaming, and chasing, in an alloy as machinable as the zinc alloys, light machine tool equipment is the handiest means. Further, whatever type of light machine tool is purchased, the die caster generally will be obliged to modify the equipment slightly and build special jigs and fixtures to adapt it to best high production practice for the particular part to be machined.

At the Doehler plant it has been found that the new low-cost variety of light machine tool, exemplified by the "Driver" line of the Walker-Turner Co. Inc., Plainfield, N. J., is most economical, most adaptable to special set-ups, and is accurate





ie Castings

and reliable. Furthermore, various elements of these tools, such as drill heads and direct-driven spindles, can be obtained separately. These machines and elements the Doehler Die Casting Co. uses as "building blocks" to rig up at a moment's notice efficient, precision, high-speed set-ups specifically adapted to almost any machining procedure on any type of die cast part.

At this point, it will be of interest to look at a few specific tooling installations in the Doehler plant and to see how they have effected savings in the ultimate cost of producing zinc alloy die cast parts.

Most of the machining operations which Doehler must perform on its castings can be performed by the rotary motion of light tools—drills, reamers, facing cutters, taps, countersinks, and the like — and, therefore, drill press units and special arrangements of drill heads serve nicely for the bulk of the work. Numerous, of course, are applications of grinders, bandsaws, flexible-shaft units, and similar tools, but for machining zinc alloy die castings the drill press outranks many times any other type of tool in versatility and extent of use.

All in all, over 300 Walker-Turner spline-spindle drill presses are found in the plant of the Doehler company — 200 in a single department. Hence, the unit saving realized by using low-priced presses wherever possible is multiplied many times, and this saving represents several thousands of dollars in the aggregate investment in tools for the entire plant.

Portability Is a Feature

Largely, these 300 drill presses are used as purchased, Fig. 1, this form being best for all-purpose work. To capitalize on the light weight and mobility of the units, however, welded angle-iron tables are made to support them. As shown in Fig. 5, these tables have no top surface, but are dimensioned to support the press base at the edges and under the bolt holes only. Weight is saved by this type of construction. Caster wheels serve as rear legs, angle iron sections as front legs; and the whole table is moved easily from one point to another by lifting the front a few inches from the floor with a hand truck and wheeling around at will. When the table is set down, the front legs provide solid fixed footing. With the aid of these sturdy tables, a production line of drill press units may be established in a few minutes to handle efficiently runs of 1000 or 1,000,000 castings.

Present interest, however, is not so much in the usual usage of drill presses as in special adaptations of drill press elements to special toolings. Many variations can be obtained simply by removing the bases, tables, and main posts from the presses as purchased, and using the remaining motor-frame-spindle assemblies as drill heads. Figs. 2 and 3 show excellent examples of special arrangements.

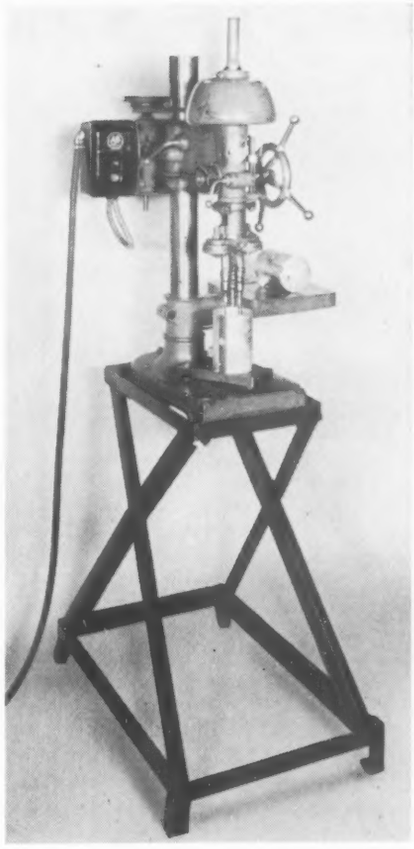


Fig. 5—With tools mounted on light angle iron tables, efficient production lines can be set up quickly

In both instances it was necessary only to produce the legs and center work table to build the handy units illustrated. All other parts are elements of standard Driver presses. In the unit shown in Fig. 2, each spindle is advanced independently, though at the same time with the other. In the unit illustrated in Fig. 3, the two spindles are linked together by a simple, adjustable rod, which diagon-

Fig. 2 (extreme left)—This tool, almost completely built from standard drill press parts, faced 280,000 castings at a 75 per cent cost saving. Fig. 3 (left center)—A simple rod linkage operates both spindles simultaneously, leaving operator's left hand free to handle castings. Fig. 4 (right)—Through ingenious adaptation of standard elements, these machines were devised for drilling the two halves of die cast radiator grilles

ally connects the tips of the two handwheel handles. All other handles are removed, excepting one in a convenient location by which both spindles are operated simultaneously. One of the operator's hands is thus left free to handle castings and operate the clamping fixture.

Tools Carry Heavy Loads

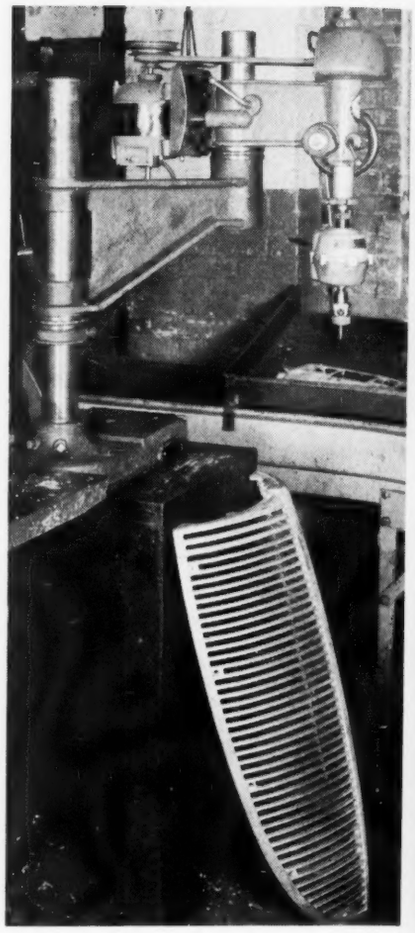
The tools which replace the chucks in the application shown in Fig. 2 are comparatively heavy, because of the large diameter of the rims to be faced and the nature of the piloting required. This affords a good indication of the load the low-cost type of light machine tool can carry. The foreman of the department in which this set-up is used reports that in 1937 over 280,000 castings were faced by this unit without replacement or repair of any part, including pulley belts. Further, he states that the accuracy and uniformity of the job was improved and 75 per cent was saved in labor alone, as against the previous method of manually grinding both ends of the casting on a disk surfacer.

The tool assembly shown in Fig. 3 is so versatile that it has been used on many runs of different castings, the only variation required for each run being in the work-holding fixture.

Figs. 4 and 6 tell striking stories of economy in machining. Both installations are used for multiple drilling of side holes in large zinc alloy die cast automobile radiator grilles. Most significant in each case is the fact that center distances between holes are too small to allow use of the drill press heads side-by-side as manufactured. However, it was a simple matter to saw off segments of the pulley housings and to relocate the individual drive motors to permit closer spacing of spindles. To situate the drive motors below the table level, it was only necessary to use a longer belt, two auxiliary pulleys, and one pulley frame with a take-up screw, as extra fitments for each spindle. All of these items, incidentally, are standard replacement parts for the Driver line of tools.

In both cases illustrated in Figs. 4 and 6, all the spindles in any line are actuated at once by a single handwheel at one end, the spindle-advancing shafts being linked end-to-end with standard type couplings. The only special parts required for the assembly of either of these grille-drilling tools are the bases which support the main posts, the tables, and the work-carrying fixtures. An estimate of the cost of these set-ups, as against the cost of similar apparatuses using standard precision-type drill heads, will demonstrate the tremendous economies to be achieved in tooling up in this manner.

Fig. 7—Two extra parts—a cast-iron lever and a length of post—double the reach of this press



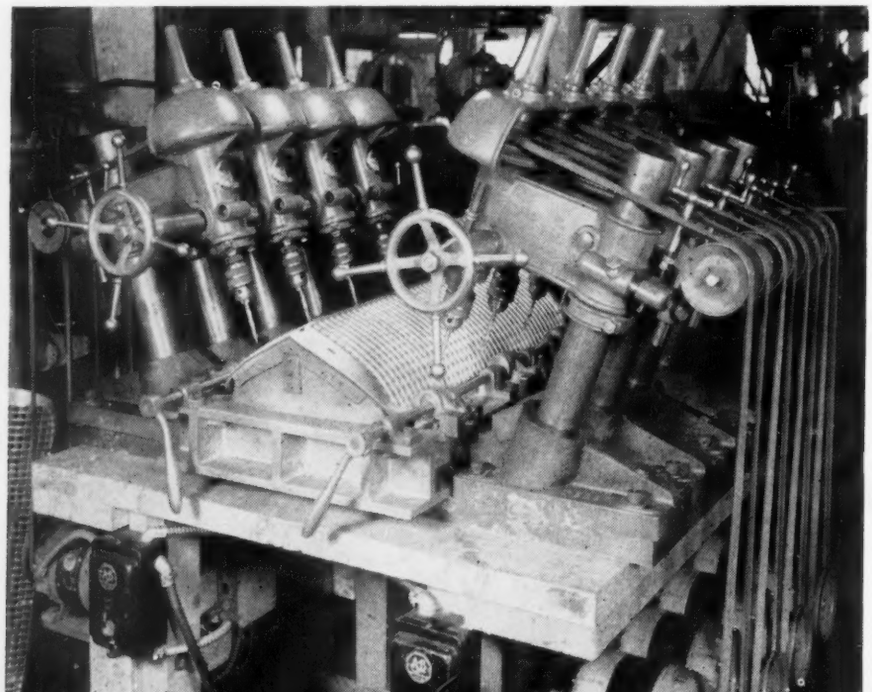
The 1938 Dodge grille, shown being drilled in Fig. 4, is made in two halves, right and left, but otherwise identical. Two banks of three spindles each therefore are used — one for each grille half — to make it possible to take either the right or left half down the same finishing line.

Spindles in Two Banks

The side drilling and counterboring of the 1938 La Salle radiator grille, shown in Fig. 6, is done all in one motion by eight spindles in two V-arranged four-in-line banks. The precision attainable is indicated by the fact that the cutting is through solid metal without even cast-in centering marks to direct the drill points.

Frequently, it is the practice to drill die cast radiator grilles by carrying them by hand down a line of standard drill presses and pegging one hole at a time. For long run jobs the labor saving attained by using special multiple-drilling set-ups, as compared with the hand method, is obvious. The foreman in charge of the La Salle grille drilling operation estimates a 50 per cent saving in labor over the

Fig. 6—Drilling eight holes simultaneously in a radiator grille. Except for the table, support post bases and work-holding fixture, all parts of the tool are standard drill press elements



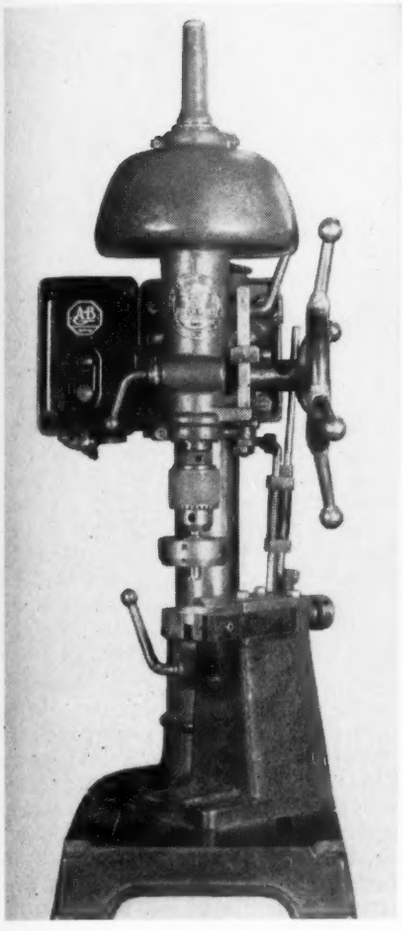


Fig. 8—Downward motion of the spindle is captured to operate the work vise, eliminating a motion for the operator

best one-hole-at-a-time practice to be most conservative for the apparatus illustrated in Fig. 6.

It should be pointed out that multiple drilling does not always require multiple spindles. Referring again to Fig. 5, showing a single spindle unit, it will be observed that the standard chuck head has been replaced by a special gear head which drives three drills. Thus, three holes are drilled by a single spindle drill head. In this instance, it is worth noting that the base of the press serves as the work surface table, the table proper being swung aside to do duty as a parts station.

More Clearance Provided

A simple but ingenious adaptation of a standard low-cost press to a special clearance job is illustrated in Fig. 7. Here again the work is a radiator grille which must be tapped in four locations down the central rib. Because of the large dimensions of the grille, there was insufficient distance between spindle and main post center lines to accommodate this job. However, with the aid of one additional casting and a length of discarded support post it was a simple matter to extend the overhang of the spindle to an adjustable and more convenient angle. Lever supports of this type find considerable use in the Doehler plant for jobs other than the one illustrated and they cost only a few dollars.

Another valuable trick in making the most of low-cost tools in production machining consists of outfitting drill presses with foot or treadle controls, so that the operator's hands may be left free for handling work and performing incidental assignments.

Functioning upside down is no impediment to today's light machine tools, and this often may be the answer to a shop stickler. Fig. 9 illustrates a pertinent case history. Here it was necessary to drill the part through the fixture and to do so with the spindle right side up required a delicate bit of jugglery to keep the part in the fixture as it was placed on the work table. By inverting the drill head as shown, the part could be placed and locked in the fixture from the top — and speed of the complete operation significantly stepped up.

Finally, it is worthwhile to note how special tools and fixtures can widen versatility of the inexpensive drill press. Ingenious fixture design adds fingers to the operator's hand and subtracts dollars from the machining department's budget. Referring to Fig. 8, motion of the bottom nut on the stop collar just above the chuck has been drafted to actuate an almost human vise, which automatically clamps the small casting to be machined as the downward feed of the spindle is begun. The tool itself is interesting too, for it reams, faces, removes burrs, and trims, all in a single contact with the part. This small set-up alone reduced the cost of finishing a light split-bearing and flange from $2.45 to $0.65 per thousand.

Possibilities Are Unlimited

The case histories here presented are all drawn from a single plant of a single company and by no means exhaust the list of possible ingenuities in adapting low-cost light drill presses to production line practice. They do, however, show clearly what can be accomplished.

Manufacturers of today's light machine tools realize the variety of the special adaptations made of their tools throughout industry, and design them with this type of usage in mind. All possible parts are engineered for easy interchangeability and maximum versatility. In planning production machining lines, the economy-wise superintendent of today thinks far beyond the over-all catalog reproduction of all-purpose equipment and envisages each individual element of a machine tool as a tool in itself — or as a building block which might be utilized in assembling a special tool specifically suited to the peculiarities of some specific job.

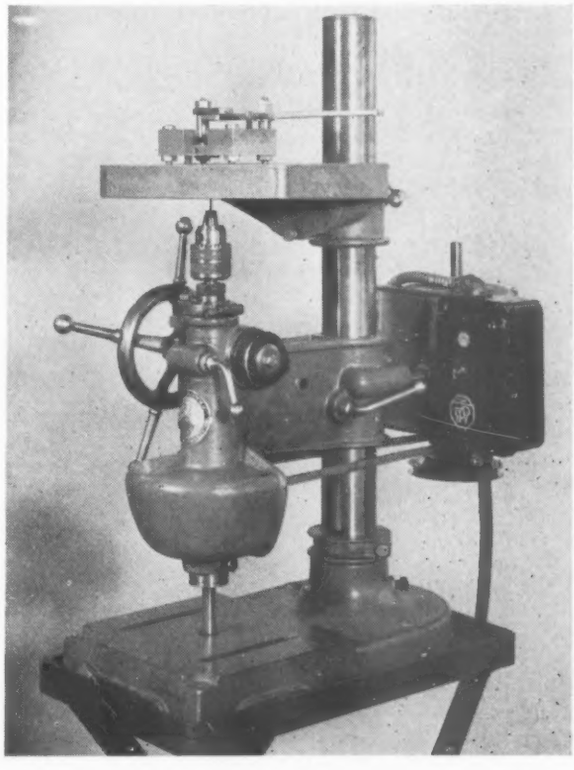


Fig. 9—Here is shown an unusual twist which reduced time and rejections in a drilling operation. Since it was necessary to drill the part through the fixture, it was easier to invert the press than the work. The part is locked in the fixture from the top

This is a master connecting rod for an aircraft engine being milled on a machine with a rotary table. Rods of this kind are finished all over. Accuracy is the object here as limits are exceedingly close approximating gage tolerances

FRED JACOBS SAYS—

Precision Plays Important Part In Production Here

■ TAFT-PEIRCE MFG. CO., Woonsocket, R. I., manufacturers jigs and special production tools including gages, reamers, magnetic chucks and other similar equipment. In business for over half a century, this company has provided gages, tools, fixtures and machines for much of the mechanized production responsible for modern mechanical equipment used in home and office such as sewing machines, typesetters, typewriters and adding machines, as well as motorcycles, automobile engines, etc.

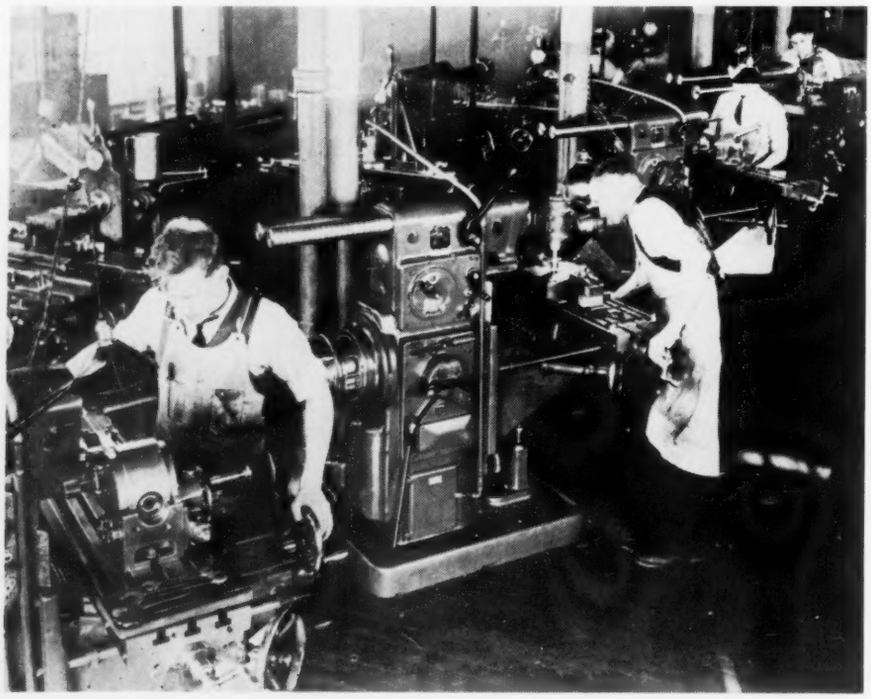
In a plant of this type, precision is of utmost importance because upon this one factor rests the entire success of many production machines. Work produced must be uniform, accurate as to dimensions and this requires extraordinary attention to precision as will be noted in the accompanying illustrations.

There was a time when jig boring was an uncertain operation. With the introduction of superprecision measuring appliances a few years ago came the demand for greater accuracy in jig and fixture boring operations. As a result precision jig boring machines in use at Taft-Peirce bore holes accurate to a few ten-thousandths of an inch.

Accuracy High

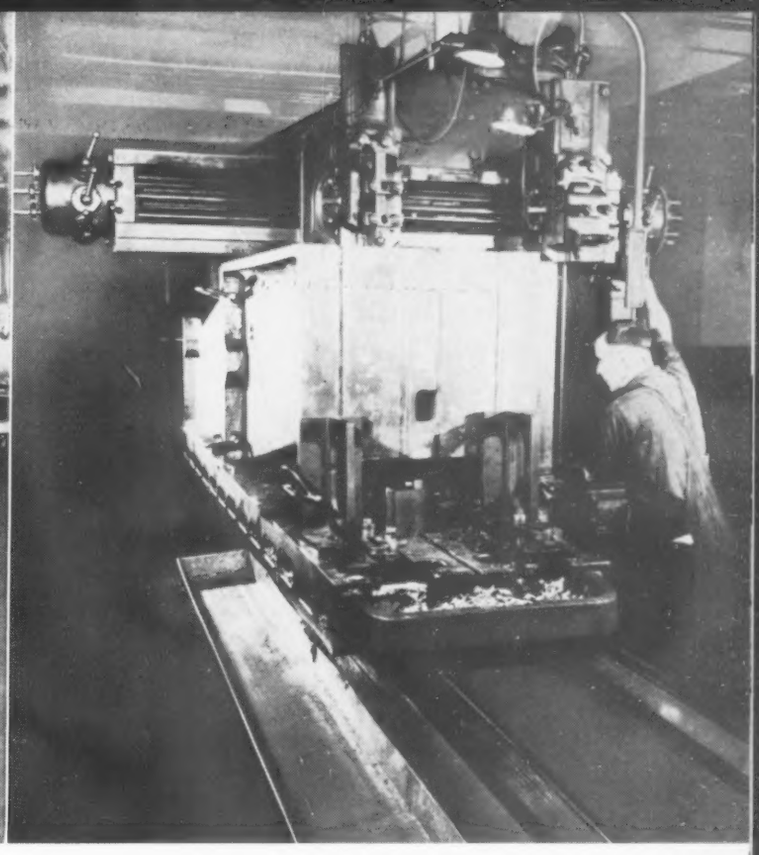
Precision surface grinders have also been developed to a high state of accuracy. Several such machines with reciprocating platens and magnetic chucks are used here. Cylindrical grinders also handle precision work here where they are used in grinding plug gages, among other things. These gages are first accurately ground to a dimension slightly under that required, the surface built up by application of chromium plating which is extremely hard and resistant to wear. Final operation involves finish grinding the chromium plated surface to desired dimensions.

Thread gages constitute another product requiring a high degree of precision. The material used is hard and the thread is corrected by careful grinding in special machines.

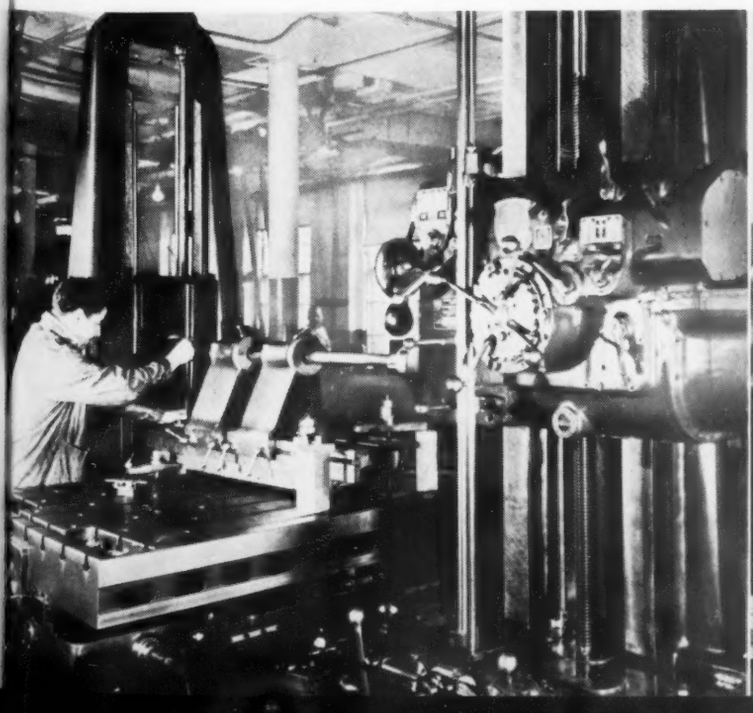


Part of tool room devoted to milling operations so essential in machining intricate shapes. In the foreground an operator is milling a part held between indexing centers while the toolmaker next to him is using a vertical milling attachment

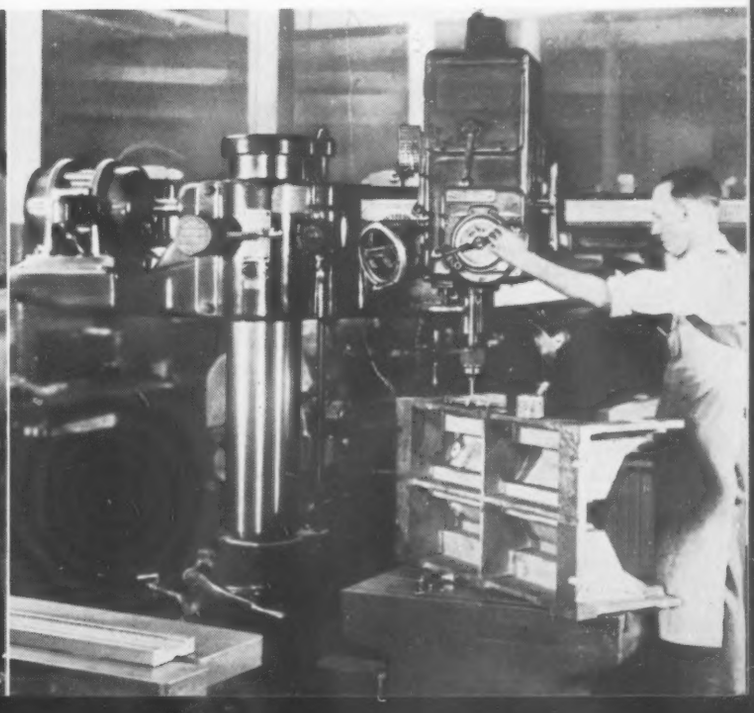
Modern jig and fixture boring operations require great precision. The battery of vertical jig borers shown here can produce holes accurate to a few ten-thousandths of an inch. The vertical design has been found to expedite accurate boring work



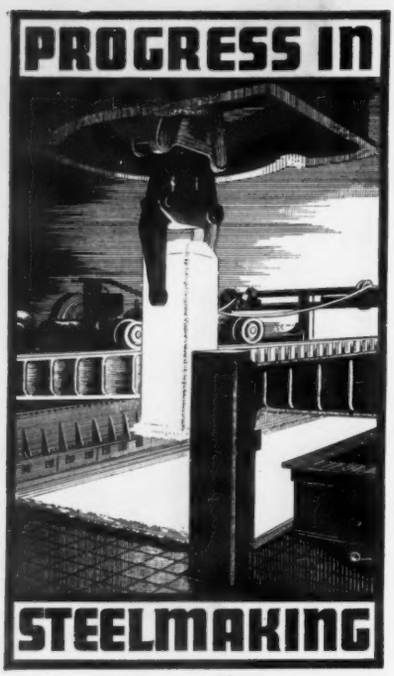
Here a machinist is planing a machine tool column on an open-side planer fitted with two heads on the crossrail. Such a machine can accommodate work which could not pass between the housings of an ordinary planer



Precision horizontal boring and milling machines are prominent at the Taft-Peirce plant as they easily handle work too bulky for jig borers and ordinary milling machines. Here two holes are being bored in alignment



Radial drills such as this unit expedite production of drilled, reamed or tapped holes in one plane as they eliminate much labor otherwise required to locate comparatively heavy pieces under the tool



Steel Quality

Although difficult to correlate variations in iron with steel quality, studies indicate minor changes in amounts of common elements have important effect on quality of steel

By H. W. GRAHAM and H. K. WORK
and
Jones & Laughlin Steel Corp.
Pittsburgh

■ TEMPERATURE, density, and moisture content of air utilized in the blast are significant factors in blast furnace operation. Moisture carried into the furnace by the blast requires heat for its dissociation; furthermore, dry cold air has a greater density than warm moist air, and so carries into the furnace a greater weight of oxygen. Both of these facts indicate that moisture in the blast, present in larger amounts during warm sultry days, tends to chill the furnace. Investigators point out marked variations in moisture content of air from day to day and even hour to hour, and state this variation may be even more troublesome than the absolute value of moisture.

Since movement of burden in the blast furnace is relatively slow, changes made in charging do not affect furnace operation appreciably until after a number of hours. Thus rapid fluctuations in moisture, content of the air and in hearth temperature cannot possibly be compensated for by corresponding changes in fuel content of the burden. As a result all blast furnaces must be run with a safety factor in burden composition sufficient to take care of the worst moisture conditions that normally would arise. This means, a furnace cannot be burdened for maximum efficiency if the blast density and moisture content are varying constantly. Neither can temperatures be maintained constant.

Variations in iron temperature are accompanied by changes in silicon and sulphur content. It seems safe to assume that changes in the shaft temperature due to variations in moisture content exert a marked influence on iron composition. Nevertheless, in spite of the recognized effect of moisture, it is not considered practical to dry the blast because of the expense involved.

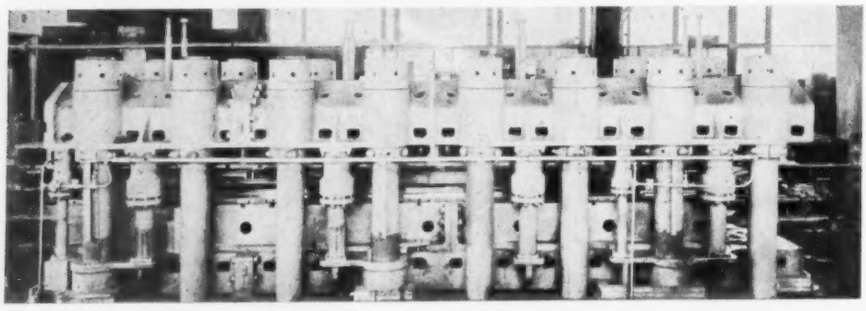
Abstract from paper read before American Iron and Steel institute at New York, May 26, 1938.

Concerned with Distribution

During the last 10 years or so, a great number of investigators have concerned themselves with the physical distribution of burden in furnace stack and flow of gases through the burden. These investigators have been interested more in furnace efficiency than quality of product, but it is true that efficient and regular operation of a furnace will generally result in a product of more uniform quality.

Irregular movement of the burden, resulting from scaffolding, slipping, etc., adversely affects iron quality in several ways. Such irregular movement may carry unreduced ore into the hearth, thus increasing oxide content of the iron. Uneven gas distribution in the stack may have the same effect. Investigation into formation of cyanides shows a movement of unreduced oxides of iron into the tuyere zone will greatly increase formation of

Produces Die-Pressed Steel Channel Sections



■ **Cold forming steel channel sections in lengths up to 30 feet from stock up to ⅜-inch thick in one operation, this 8000-ton Baldwin-Southworth hydraulic press is a recent acquisition of Youngstown Steel Car Co., Niles, O. The press is equipped with heavy cast-steel holders, adjustable in any width from 3 inches to 20 inches in variations of ⅛-inch. Thus a wide variety of sizes of die-pressed channels can be produced, with no die costs involved. Especially is the equipment suited to forming of alloy steels, since it is not often possible to obtain alloy steels in special rolled sections. Typical users of such sections are found in the truck, trailer and railroad fields**

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cyanides and nitrogen content of the iron.

In addition, it has been shown that a great amount of heat is required for cyanide formation; the presence of unreduced oxides and the resultant formation of cyanide, therefore, would have a cooling effect. The tendency towards formation of shrinkage cavities in castings made from blast furnace iron was decreased by increasing the rate at which the ore burden traveled through the furnace. This speed naturally is affected by size and distribution of burden.

Depends on Properties

Physical condition of the burden depends not only on size and distribution, but also upon physical properties of its three elements, ore, limestone, and coke. To test this characteristic a method of evaluating reducibility has been developed. It was found that reducibility varied directly with porosity, a property which may be measured rather easily. Both reducibility and porosity vary with the size of ore lump. It has been suggested that ore for the burden be crushed to such sizes as will exhibit a uniform porosity, the absolute value of which would, of course, depend on other conditions of furnace operation. By crushing large lumps of ore to this determinable size and sintering fines, a uniform ore burden should be obtained with consequent beneficial results in uniformity of furnace operation and more uniform composition of iron.

With regard to limestone, the important physical property is its resistance to crushing on calcining. It is obvious that a stone which crushes easily to a powder on calcining will give different results than one which retains its shape. Sizing of the stone likewise is said to promote smoothness of operation.

Coke in most blast furnace plants is subjected to a shatter test and is screened for uniformity. Other tests which have been proposed and used as measures of the physical quality are the critical air blast, wet oxidation test, apparent density, apparent porosity, combustibility, and reactivity tests. As in the case of limestone, physical strength of coke is important, also its rate of combustion.

Control over chemical composition of burden is accomplished by mixing raw materials from various sources to obtain the best average compositions possible from given sources of supply. Furthermore, relative amounts of various materials must be proportioned carefully to form a slag of most suitable composition, since slag exerts a marked effect on composition of iron produced.

Ores must be selected carefully to give an iron suited for the particular steelmaking process in which it is to be used. Presence of certain elements such as titanium, chromium, and vanadium results in highly infusible slags which derange blast furnace operation. Presence of impurities in limestone also results in unnecessarily large slag volumes which hamper regular operations.

Both sulphur and ash content of coke have a direct bearing on iron quality. Sulphur in cast iron is obtained directly from coke and it may be reduced in hearth only by close control of temperature and of slag basicity. Influence of coke ash content has been investigated. A variation in ash content of the coke from a minimum of 9.57 per cent to a maximum of 15.84 per cent caused a variation in sulphur in the iron from 0.030 per cent to 0.194 per cent during a period of only 24 hours.

This large variation in sulphur content for a relatively small variation in ash content is explained by showing that an increase in ash content of the coke is cumulative in effect: Increase in ash decreases percentage of total carbon in the coke, and also increases weight of slag formed. This in turn requires increased carbon to raise it to its melting-point and then heat it to furnace temperature, thus reducing considerably the carbon available for other necessary chemical and thermal reactions of furnace operation.

Other investigations showed a relationship between variations in percentage in coke ash and variations in silicon and sulphur content of the iron. Presence of ash is said to be objectionable in another way. Formation of alkali cyanides in the tuyere zone can only proceed if some alkali metals are present in the burden. These are introduced almost entirely in the coke ash.

Composition of limestone is important as affecting the desulphurizing power of slag. Presence of magnesium oxide is somewhat deleterious to desulphurizing if slag is acid, but is decidedly favorable in more basic slags. Also presence of magnesium oxide reduces slag viscosity, which in turn reduces its desulphurizing power.

Use of scrap in the burden, although not a universal practice, constitutes a possible source of trouble through the introduction of unwanted residual metals in the iron.

A high rate of driving need not adversely affect iron quality if furnace is properly burdened, but a rate of driving which brings unreduced ore into the tuyere zone and hearth is detrimental to quality because oxide content of the iron will be raised and formation of alkali cyanides and absorption of nitrogen by the iron will be greatly increased. If driving rate exceeds rate of combustion, furnace will be cooled and sulphur will rise excessively. Irregular driving is detrimental to iron quality, as is every other factor adversely affecting regularity of furnace operation. A steep temperature gradient during a blowing period between casts, caused by erratic driving, is productive of variations not only in silicon and sulphur content, but also in carbon content of the iron.

In considering temperature in the blast furnace it is necessary to know the point at which the temperature is determined. The interior of the blast furnace covers a wide range of temperature, but points of greatest interest are fusion zone and hearth. Unfortunately, it is extremely difficult to measure accurately these higher temperatures within the furnace. Consequently temperature of iron in the runner is measured. Temperature within blast furnace

TABLE I

Effect of Residual Sulphur on Killed Steel

(Results expressed as change from normal)

Per cent Sulphur	Chipping Tons/man-day	Outside Seams	Inside Seams	Total Tube Loss
0.030 and under	+7.1	—0.3%	—0.2%	—1.2%
0.031–0.035	Normal	Normal	Normal	Normal
0.036–0.040	—1.6	+0.6%	+1.0%	+0.7%
0.041–0.045	—2.1	+1.6%	+1.3%	+3.4%

*Based on data from approximately 13,000 tons of steel.

TABLE II

Effect of Manganese

(Results expressed as change from normal)

Per cent Manganese	Chipping Rejections	Chipping Tons/man-day
0.45 and under	Normal	Normal
0.46–0.50	+2.1%	—0.4
0.51–0.55	+8.8%	—1.2
0.56–0.60	+10.0%	—1.9

hearth, as represented by temperature of iron in the runner, has an important effect on composition of iron produced.

It is difficult to correlate variations in iron quality with variations in steel quality due to many factors involved and due to operations in steelmaking having such pronounced and varying effects on steel produced. Difficulty of separating effect of these factors from more distant effects of variable in iron quality has discouraged much work. Also set-up of ordinary steel mill is such that it is practically impossible to make any type of quality determination on the steel, except chemical, until it has been cast into ingots, heated in soaking pits, rolled through blooming and possibly bar, billet, slab, or rail mills.

The first quality determination is yield from blooming mill, or surface of blooms or billets on chipping beds. On any individual heat, however, these indices are of little help. Nevertheless, by grouping a large number of heats, classifying and averaging them in terms of the variable being investigated, it is possible to arrive at effect of variations in a given constituent.

Principal Heat Source

Silicon is important in the bessemer process, since it is principal source of heat for the refining operation. Consequently, it must be held within narrow limits. In the open hearth process silicon has been considered relatively unimportant. Recent increased attention to slag-metal relationships has emphasized importance of silicon content of iron. This is particularly important in making rimmed steel, since if silicon is high the steel may contain insufficient iron oxide to insure a satisfactory rimming action in the mold.

Unfavorable influence of sulphur on surface quality necessitates greater study of control of this element. Not only does it adversely affect finish of rolled sheets but its effect on other products is equally important. Table I, expressing effect of residual sulphur on deviations from normal amount of chipping necessary and normal rejections due to defects, shows a marked increase in both of these factors for steel made from high-sulphur iron. The 3.4 per cent increase in rejections due to an increase of sulphur of 0.010 per cent represents approximately 440 tons of steel.

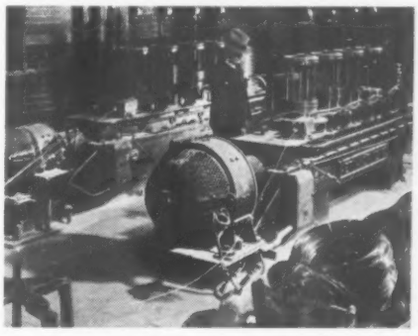
Manganese is an important element in steelmaking. It is generally considered beneficial in iron for open hearth steel but detrimental, if too high, for bessemer iron, particularly that used for bessemer screw steel. Optimum value of manganese for bessemer screw blowing is around 0.45 to 0.50 per cent. Increasing manganese is accompanied by considerable loss of metal due to slopping in converter. Furthermore, it is conductive to poor surface quality of the steel. Effect of manganese on surface quality is shown in Table II, which was compiled from data extending over approximately 100,000 tons of billets.

Phosphorus in iron for the basic open hearth is not considered important if it is not too high. When high, task of removing it increases length of time on heat and complicates slag problems. For bessemer process, however, phosphorus is highly significant. It is not removed in the acid bessemer process; in fact it increases about 10 per cent due to loss of other elements. Consequently, because of its effect on physical properties of steel, it is necessary to limit the maximum percentage in the iron.

It is evident that actual quantitative knowledge of effect of iron quality on steel quality is by no means complete. Nevertheless, a certain amount of such work already has been done. These studies indicate minor variations in amounts of common constituents in iron have an important effect on steel quality. Further work along these lines may lead to a closer co-ordination between efforts of blast furnace operators and steelmakers.

New Machines Simplify Threading of Spring Wire

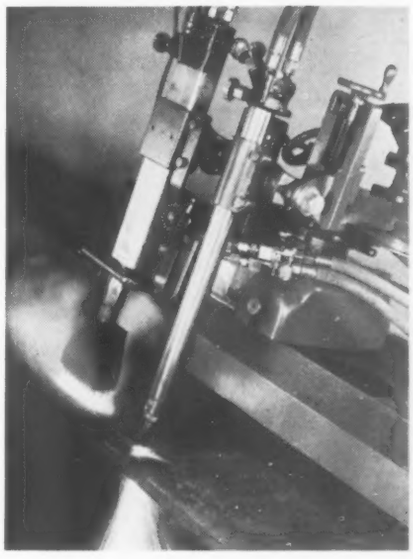
■ Improved quality spring wire is being produced by Jones & Laughlin Steel Corp., Pittsburgh, on new machines manufactured by Aetna-Standard Engineering Co., Youngstown, O. They are of the general Connor type except that the takeoff of wire is overhead rather than through the block center. This makes for easier threading and simplified transmission. They incorporate a water cooling system to control to best advantage the heat generated in the drawing process, and curtail duration of the critical heat. On the finishing block No. 19 wire at 400 feet per minute is cooled so fast that no more than three of four wraps at the block fillet have any sensible warmth and intermediate blocks naturally run cooler. The resulting spring wire is said to have a combination of high tensile strength exceptionally resistant to fatigue and uniformity to gage.

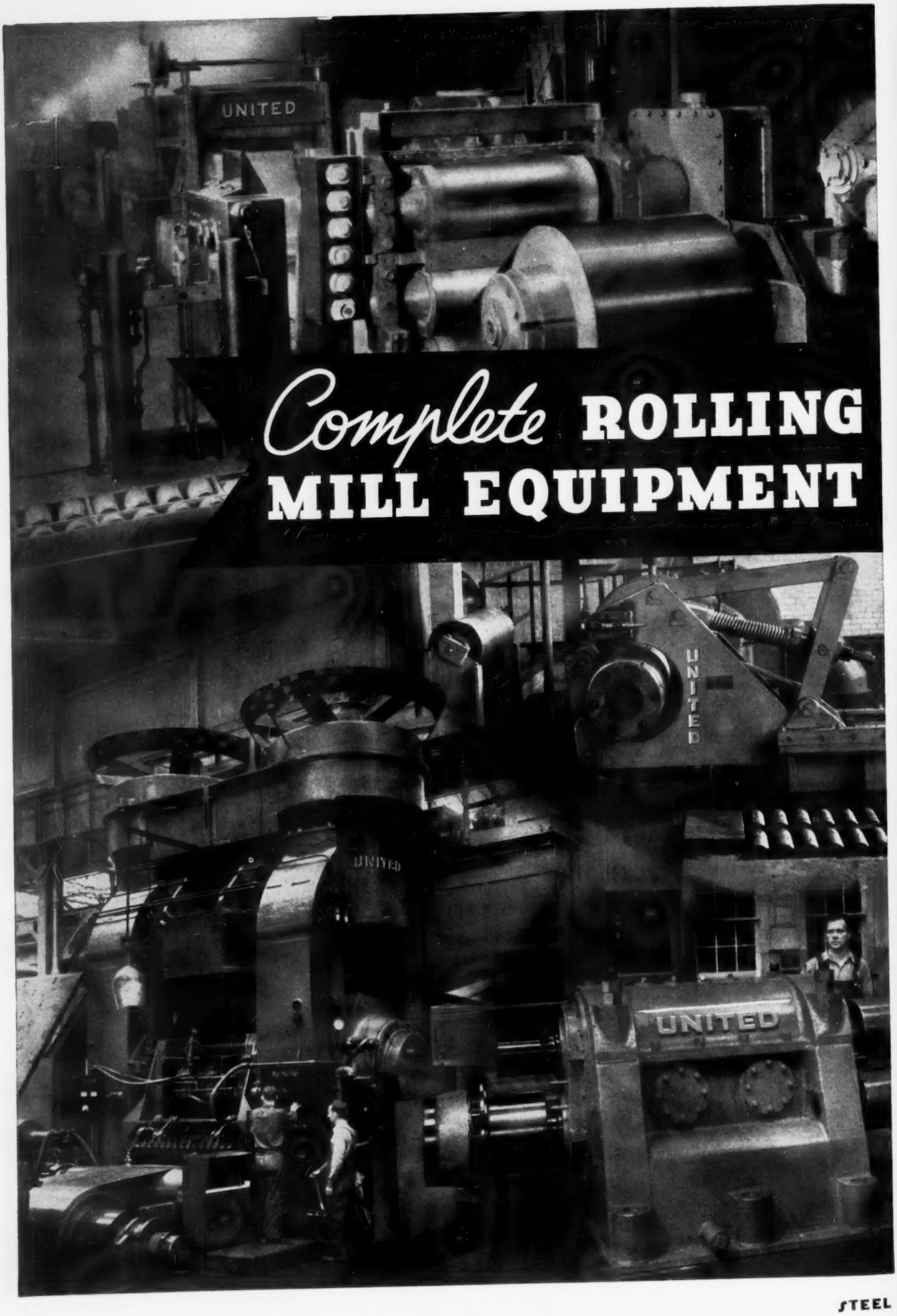


These new wire drawing machines, installed by Jones & Laughlin Steel Corp., Pittsburgh, are featured by water cooling and other improvements. Spring wire of improved quality is drawn on them

Cuts and Softens

■ **Many steels may be flame cut without any detrimental effect, but a number of hard grades of steel, particularly low - alloy strength steels, tend to harden along cut edge. Flame softening provides a means for removing this hardness. Multi-flame heating heads, which usually operate simultaneously with cutting, furnish additional heat to the body of the metal so cut edge is either annealed or tempered, depending of type of steel. Above a 1-inch thick low-alloy structural steel is being softened by means of a 30-flame heating head. Photo courtesy Linde Air Products Co.**

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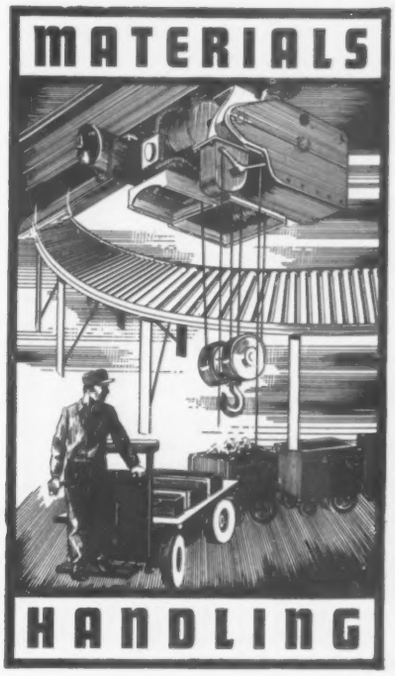

Skid-Box Supports

Welded steel frames support skid boxes at operating level in tilted position which automatically unloads small castings onto pickup platform, reducing operator fatigue

J. A. CRONIN, Materials Handling Editor

■ SEEKING a way to facilitate loading of cast iron cylinder bodies for hydraulic brake actuating members, a system was recently worked out at Delco-Brake division of General Motors' Dayton plant which has been found of considerable value in decreasing operator fatigue.

The large steel tote boxes in which the castings are placed prior to loading into the automatic machining equipment are about 3 x 3½ feet by 2 feet high and hold approximately 1¼ tons of castings which may weigh 16 to 20 ounces apiece. These skid boxes are handled by electric truck from unloading platform to an aisle underneath a hoist runway which feeds three lines of machining, drilling, boring and facing equipment.

Lifted by Tapered Pins

Overhead hoist running on a monorail is fitted with a lifting fixture shown in Fig. 1 which lifts the skid boxes by tapered pins locking through ears as illustrated. Pins are chained to fixture to prevent loss. Cranes place skid box on welded steel frame near loading station. Then door in end of skid box is raised to permit castings to slide out into pickup trough which is part of the frame. This is shown in Fig. 2.

This places castings where operator can get at them easily, shortens time required to load them into machining fixture, shown at extreme left in Fig. 2, and prevents operator fatigue incident to leaning over and picking up casting from tote box placed on floor as is usual custom. The operators find this sepecially valuable as the tote box becomes nearly empty. This previously necessitated leaning over to reach to bottom of container near floor level. Now operator has entire load at one uniform loading location since tilt of frame causes castings to flow out on pickup platform even when skid box is nearly empty.

Fig. 3 shows setup made to facilitate handling these parts as they are processed. Rough machining, intermediate machining, final machining, drilling, boring, and finishing operations are not uniform with all pieces so that a particular continuous setup is not practical. However, a continuous moving belt, as shown in Fig. 3, is used to carry the work from station to station, the various machines being arranged in two lines on either side of the belt.

Operators take off the belt the particular pieces which they are to process. When their operation has been completed they place the work

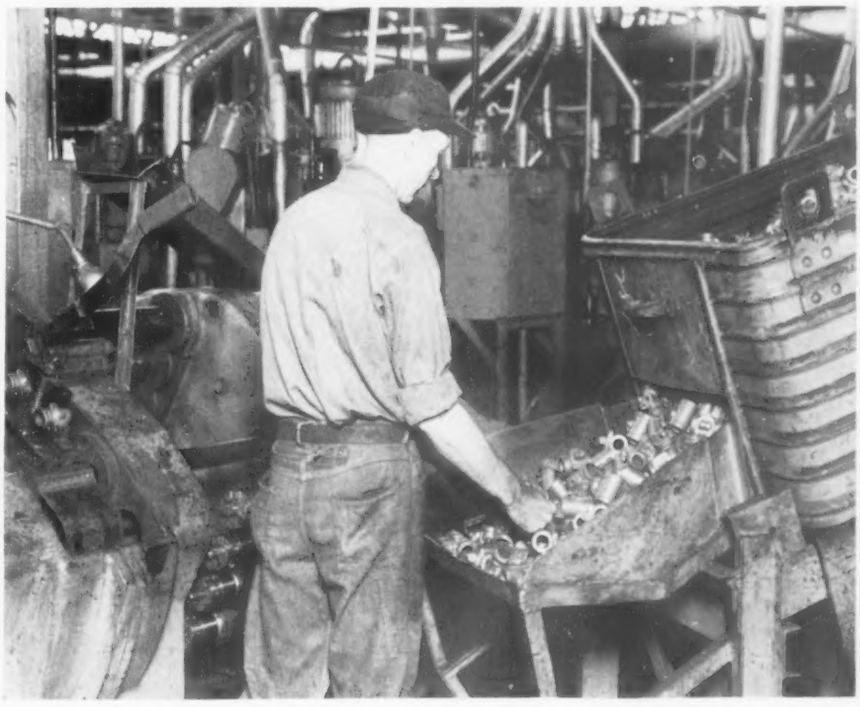

Fig. 1—Placing steel skid box holding supply of castings. Overhead hoist serves several lines of machines

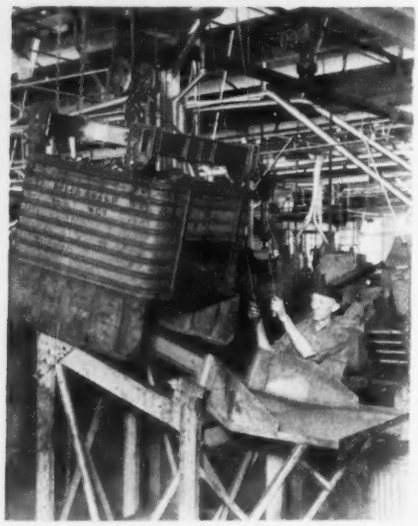

Fig. 2—This shows how easy it is for operator to reach castings which flow out of door in end of skid box onto pickup chute from which they are loaded into clamping fixtures on automatic machining equipment at extreme left

back on the belt which then goes to succeeding operations as required. In this way no large amount of parts accumulate at any one station and it is necessary to operate only those particular machines required by the work at hand.

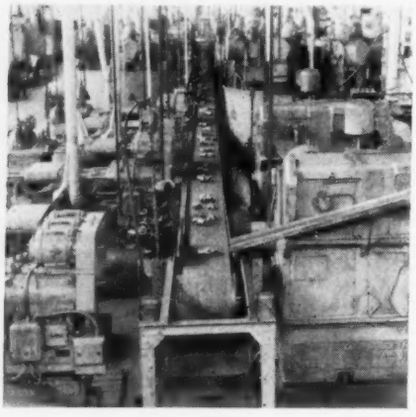

Fig. 3—Endless belt is used to transfer parts from station to station. It moves between two rows of machines as shown here

Ingot Molds Handled In Novel Manner

■ A LARGE STEEL mill is handling ingot molds in a rather novel manner by means of a special lifting device suspended from the double hooks of an overhead electric traveling crane. This lifter, while designed especially for this particular operation, is very similar in principle to devices which are now commonly used throughout the industry for handling sheet steel in large unit loads. So far as is known, this is the first instance of its use for handling molds, at least in the manner of this application.

This lifter will handle two large molds 19 by 34 inches, or three intermediate molds 25 by 25 inches, or four small molds 18 by 18 inches. There are also two other sizes used in this plant, these being of dimensions between the largest and the smallest of those mentioned. The lifter has a capacity of 25 tons and is motor-operated. The weight of three intermediate sized molds of 25 by 25 dimensions is approximately 36,000 pounds.

Before steel is poured, molds are first dipped in a graphite solution and then sprayed on the inside with

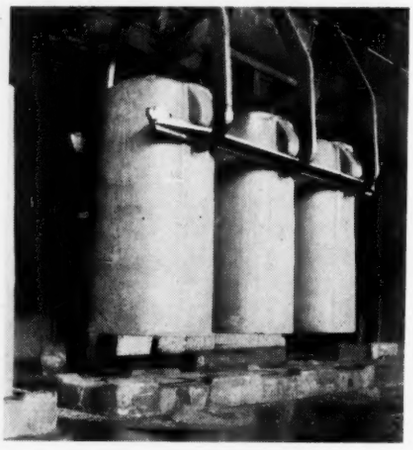

Fig. 1—Special lifter picks up three ingot molds from transfer car

tar. How the new handling method is fitted into this operation is shown in the accompanying illustrations. In Fig. 1 three of the intermediate sized molds are being picked off the car. It will be noted that the entire handling job is controlled from the crane. The latter then transports the load to the dipping tank of graphite solution, and lowers the molds into the tank as shown in Fig. 2.

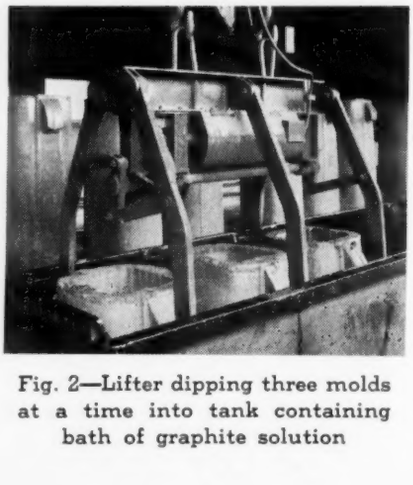

Fig. 2—Lifter dipping three molds at a time into tank containing bath of graphite solution

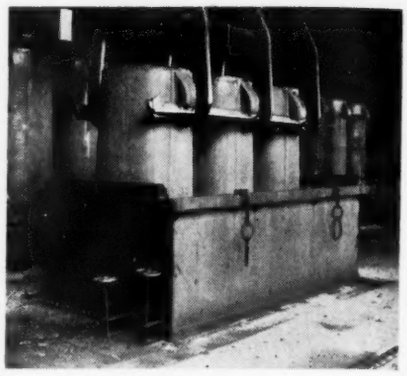

Fig. 3—Molds being dipped into tank for tar spraying. Note double hooks from overhead crane to prevent side swinging of load

Following the dip, the crane and lifter transport the molds to the tar spraying tank, which is shown in Fig. 3. The tar spraying is done through nozzles located at the bottom of the tank and in proper posi-

(*Please turn to Page* 70)

Elastic Properties of Nonferrous Metals

■ *Elastic Properties of Nonferrous Metals and Alloys: Collected Data,* by J. McKeown and E. D. Ward; cloth, 70 pages, 12¼ x 9¾ inches; published by British Nonferrous Metals Research association, London, England; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Information presented in this book, which is in the form of tables and graphs, has been gathered from a large mass of published material and from the association's own research. Published material was subjected to a critical examination to meet a high standard of fullest details on composition, condition as tested, including the form, method of production, and sensitivity of the strain measuring apparatus. The greater part of the data given have been obtained from tensile tests. Elastic data from torsion and bending or more complex tests have not been included.

In addition to elastic properties, in many cases information on ultimate tensile strength and elongation is given. The metals and alloys are divided into four groups with numerous subgroupings, and include: Copper and its alloys; nickel, cupro-nickels, and nickel alloys; light metals, and gold, silver and platinum group metals. All told, 219 metals and alloys are tabulated, and the volume includes literature references from which the data were obtained, and an index.

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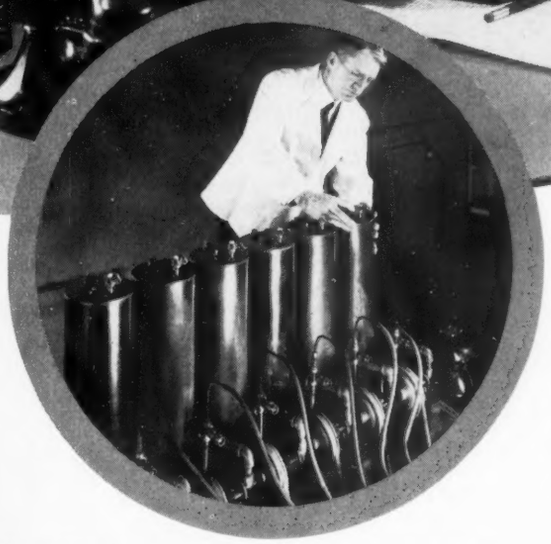
GULF OILS!"



Here is one of the machines Gulf's technical men have devised for testing lubricating oils. The oil, mixed with water, is circulated rapidly through the machine while a stream of oxygen is whipped thoroughly into it. Many oils have been tested with this instrument but none have shown stability equal to Gulf's higher quality oils.

GOOD CRUDES, refined by modern methods, make fine lubricating oils—oils that prove their quality in industry's machines. Performance in actual service is the real test of any product, including oils and greases.

Yet Gulf research engineers have not been content with the usual service tests for Gulf's higher quality lubricants. They have devised laboratory instruments which punish oils far more severely than any machine in industry . . . instruments that find ways to make oils oxidize and break down. As a result of these tests, Gulf engineers then develop oils with such characteristics that they can stand far greater punishment than they will ever receive in normal service. Thus users are assured of oils that possess a "margin of safety" well beyond average requirements.

There's a real quality story behind Gulf oils and greases. Let a Gulf engineer demonstrate to you—on the job—how Gulf's higher quality lubricants provide a greater measure of protection for your equipment—and help you reduce maintenance and repair expense.

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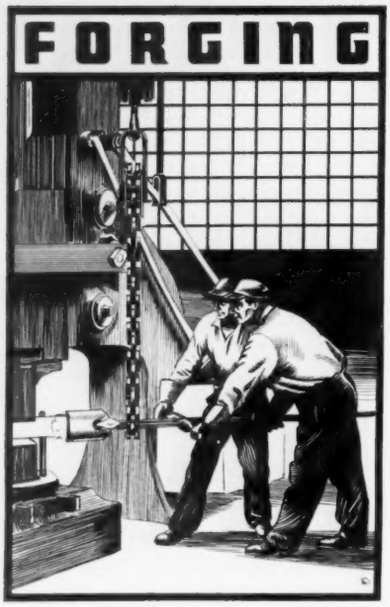


Automatic Production

Features in this forge shop include monorail system for fast handling, automatic continuous pickling and hardness testing, robot transfer from quench to draw furnace

BY J. B. NEALEY
American Gas association,
New York

■ ONLY FOUR and a half hours are required to make a Chevrolet crankshaft. In that time the steel billet is heated, forged, heat treated and pickled in a plant completely modernized with automatic devices and moving conveyors. High efficiency is aided by gas furnaces which are continuous and automatic, both as to production and temperature control.

Use Six Furnaces

About five carloads of crankshafts are made daily at the Detroit plant of Chevrolet Motor division. Heating for forging is done in six gas furnaces. Close to 35 feet in length, each of these pusher type furnaces is fired from the rear with gas burners. The billets, weighing 100 lbs. each, are brought to the roller loading conveyors of the furnaces by monorail conveyor and transferred by air-hoist, with tongs. From here they are pushed through the furnaces on water cooled rails where they are heated to 2280 degrees Fahr., remaining for 42 minutes. This temperature is maintained with automatic controls.

At the discharge end, transfer to the forging hammers is by tongs and monorail. The 12,000-pound forging hammer die has three cavities through which the hot steel billets pass successively and are rolled while being broken down to rough shape and forged to final shape. Flash then is cut off and the tong holds separated in a single operation on a trimming press. The flange is formed on one end in an upsetter and crankshaft is finally restruck in two successive positions of the dies of a 5000-pound steamhammer. Less than a minute elapses from the time the hot billet is withdrawn from the furnace until the forged crank is transferred from the restrike hammer to a conveyor which carries it to the heat treating furnace.

Scrap steel is disposed of by placing it on an overhead chain conveyor, equipped with hooks for the flash and pans for the tong ends. This carries it to a yard with spur tracks and bins where trippers dump flashings into railroad cars or bins as desired. They are finally sold for scrap. Tong ends are carried along to another set of storage bins and trippers. From here they are drawn for forging into hubs.

Retains Heat

By a quick transfer from restrike hammer to heat-treating furnaces, from 700 to 1000 degrees Fahr. of heat is retained by the forged cranks, which materially reduces fuel consumption in this process. There are six heat-treating furnaces arranged in three units and fired with fuel gas. Each unit includes a high heat and draw furnace arranged in tandem with a quench tank between. While similar units have been similarly arranged before, few if any have ever been

Fig. 1 — Billets, weighing 100 pounds each, are brought to roller conveyors loading furnaces on monorail and transferred by air hoist with tongs

Fig. 2—Billets are heated to 2280 degrees Fahr. and transferred from furnace by tongs suspended from overhead monorail to forging hammers shown in Fig. 3

Fig. 3—Hot billets are forged in this 12,000-pound hammer. Trim press is in background

completely mechanized. It is not necessary to have an operator lift hardened work from the quench to the draw furnace as Chevrolet has substituted a mechanical device. Since the furnaces themselves are automatic and continuous in operation, this device renders the entire process automatic and continuous.

Fig. 4—After forging, trim press cuts off flash and tong holds. Flange is upset on crankshaft as shown here

The high-heat furnaces are 35 feet and the draw furnaces 40 feet in length, respectively, in order to synchronize the two heating cycles. They are heated by gas burners arranged along both side walls and temperatures are regulated by automatic temperature controls with recording pyrometers. Controllers and recorders are located in a central control room together with those of the forging furnaces. Burners are equipped with zero regulators which drop the gas to atmospheric pressure. They receive air at 2-ounces pressure from a blower. By means of venturi mixers, gas is inspirated by the air in correctly proportioned volumes.

Air Blowers Used

Three blowers furnish all the air used by the gas burners of all 12 furnaces. These blowers are located on top of the central control room and air lines to each of the furnaces are taken off the manifold at this point. Air pipes are arranged in rows in the control room and each is provided with a motor-driven valve and temperature controller. In this way all the furnaces are under the constant supervision of the metallurgist. Inasmuch as some of the furnaces are zoned there are 20 regulators and 20 recording pyrometers in this room.

Each furnace is equipped with rails and mechanical pushers and the cranks ride through on shoes in four parallel rows. Between the two furnaces and above quench tank is a handling table or rack operated by a motor-driven screw. This moves forward in synchronization with opening of discharge door of the high-heat furnace and the hot cranks and shoes are pushed out onto it. At that moment, motor-driven arms rise out of quench tank, lift cranks off shoes, the table withdraws and the arms lower hot cranks into quench tank. After a sufficient interval, cranks in quench are raised, the table moves forward and cranks are replaced on the shoes by the arms. Table then moves in reverse until work is in position for pushers of draw furnace to act upon it.

Forgings are in high-heat furnace for 65 minutes where they are heated to 1550 degrees Fahr. They remain in the draw furnace 83 minutes where they attain a temperature of 1100 degrees Fahr.

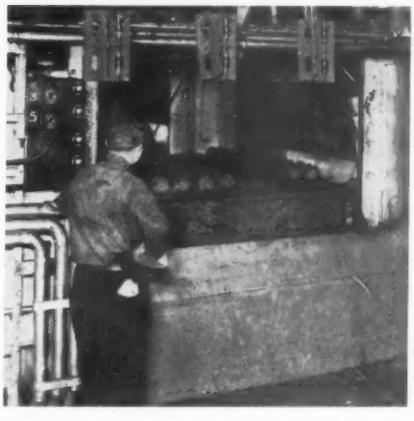


Fig. 6—A set of steel arms lifts cranks after they emerge from the high heat furnace, immerses them in quench tank and replaces them on shoes ready to be pushed into draw furnace

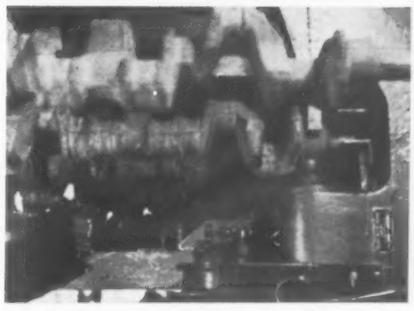


Fig. 7—Brinell tester at right, with photo-electric cells, tests hardness automatically as cranks pass through on conveyor

Cranks are transferred from discharge and cooling table of the draw furnace to acid resisting hooks on an overhead monorail conveyor which carries them through a pickle. This pickling operation has been made entirely automatic and requires no attention whatever. By passing an alternating current through the acid bath and adding a special inhibitor, pickling time has been cut from one hour to 15 minutes. The same conveyor carries the work through a rinse, past a grinder which grinds a spot on each crank and past a brinell machine which automatically presses a ball into each spot and provides an automatic hardness test.

The hardness reading, 286 to 228 brinell, is taken and work finally inspected and gaged for correctness of throw, spacing of cheeks, etc. Cranks then go to the machine shop. Only 3 per cent fail to pass rigid inspections and are rejected which indicates the close control possible with the automatic equipment described.

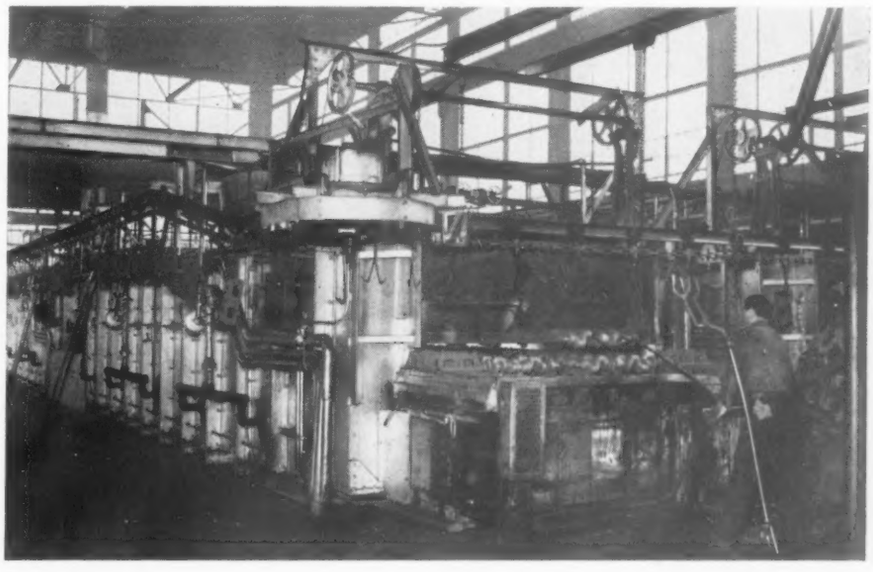


Fig. 5—Heat treating is done in one of three continuous units, each consisting of high-heat and a draw furnace

Announce Complete Line of Turret Lathe Tools for Improved Cutters

■ A NEW LINE of turret lathe tools, the first developed since the adoption of tungsten carbide cutters, was announced by Warner & Swasey Co., Cleveland.

Many new tools and practically all old tools, holding devices and miscellaneous equipment have been designed to meet requirements of increased power and improved cutters. They are more massive, provide greater rigidity and increased holding power.

One of the completely new tools is an adjustable single turning head which has one head adjustable in the vertical position. With this tool, turning cutter holder held in an adjustable block is quickly set to size and can be changed from one job to another by moving the block up and down.

Arrangement Improved

Other improvements are in the arrangement of heavy duty, multiple turning heads and overhead pilot bars. The multiple turning head is equipped with a pilot bar bushing which makes possible the use of a stationary bar clamped to the head of the machine instead of an overhead pilot fixed to the turning head. With this tool, only one overhead pilot bar is needed to serve any number of heads on the turret.

A quick acting slide tool combined with a boring and recessing tool is another new device in the line. It is designed for fast recessing, the slide moving ½-inch with a quarter turn of the handle. The unit also has a graduated dial located on the stop screw which makes adjustments for size when accuracy is required.

The multiple cutter turner, designed for combining in one operation from two to four heavy turning cuts on bar work such as shafts, studs and bolts also is new. With this, multiple cuts can be taken with heavy feeds. Roll brackets fasten to cutter blocks and are braced against the back of tool. Result is, rolls will not spring away from the work and additional cutters can be added without changing the cutting diameter of those already set. This unit is made in sizes ranging from ¼ to 7 inches.

An adjustable angle cutter holder with wedge-type slide lock, taper turner with roller back rest for turning locomotive frame bolts, an adjustable knee tool for short bar work, stub boring bar sleeves for eliminating excessive overhang on small diameter stub boring bars and stub boring cutter heads for combining chamfering and boring cuts in one operation are other tools designed to increase the productivity and efficiency of the turret lathe.

(Top)—Cutter holder of single turning head is set to size and changed from one job to another by moving block up or down. (bottom)—Slide tool for fast recessing and facing cuts on hard and soft metals

With this multiple cutter turner, one to four cutters can be set in any combination for turning diameters on shafts, studs and bolts

Chucks in the heavy duty class which are being presented are adaptable to flanged spindles and pressure lubricated. In T-slot types, masterjaws are recessed below the face of the chuck to allow the mounting of fixtures without removal of the jaws.

Finds "Superconductors"

■ Workers in laboratories of National Bureau of Standards recently discovered that certain metals showed the remarkable property of losing all of their electrical resistance, becoming "superconductors," at the low temperatures possible with liquid helium, 452 degrees Fahr. below zero.

Just what practical applications may grow out of this, it is hard to say although scientists believe it offers a wide field for future development.

New Synthetic Hard Carbide

■ Discovery of a synthetic tungsten titanium carbide may prove an important advance in the metal-cutting art because this compound produces fine-grained hard metal compositions. Four patents have been issued to Philip M. McKenna of Latrobe, Pa., covering the manufacturing processes involved in making tungsten-titanium carbide and the related hard compositions, as well as the material and compositions themselves.

The new compound is synthesized in a metallic menstrum of nickel at a temperature above 3600 degrees Fahr., the nickel being removed by chemical means to leave lustrous steel-colored particles of tungsten-titanium carbide, possessing unvarying physical characteristics and chemically simple atomic proportions.

Main use of this compound at present is as an ingredient in the manufacture of hard carbide alloys for steel-cutting tools in the form of blanks for tool tips, rolls, drawing dies, lathe centers, gage parts, rings, balls and other shapes, all harder than any tool steel, it is said. Strength varies from 200,000 to 330,000 pounds per square inch in transverse rupture tests. Tool blanks of compositions of tungsten-titanium carbide are brazed to steel shanks with copper or bronze to make tools for turning, boring, facing, milling, keyway cutting, reaming, etc., of steel articles. Steel with a hardness of 67 Rockwell C, about the maximum that may be produced, has been turned with such compositions although its greatest use is in machining steel heat treated from 250 to 550 brinell, work done with precision and long tool life.

Speed of cutting is customarily two to six times that of high-speed steel tools on similar work. Range of work handled includes rough and finish machining of S.A.E. 1045, 1020 to 1095, T1340, 3140, 52100 and stainless steels. Brake drums made from an improved cast-iron, a copper-silicon alloy, have been machined with intermittent facing cuts over bolt pads and unusually long runs between grinds obtained despite shocks on the cutting edge.

Welding Society Has New Publications Available

■ American Welding society, 33 W. 39th street, New York, in addition to its widely used "Welding Symbols and Instructions for Their Use," now has "Rules for the Welding of Gravity Tanks, Tank Risers and Towers" and "Code for Fusion Welding and Gas Cutting in Building Construction Part A—Structural Steel." The latter contains an appendix giving specifications for filler metal, a qualification test for welding operators, recommended practices and diagrams showing weld characteristics.

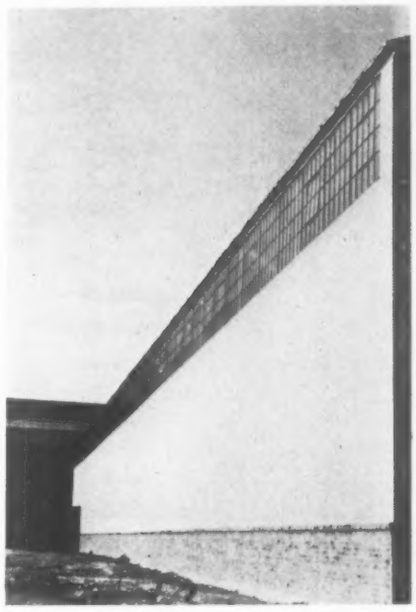
Industrial Curtain Wall Is Entirely Fireproof

■ A new type of insulated industrial curtain wall for steel frame factory buildings has recently been developed by Johns-Manville, 22 East Fortieth street, New York. It consists of an application of encased insulating board, 1 inch of insulating board with a ⅛-inch veneer of asbestos Flexboard or flat Transite, over which is applied a wall of corrugated Transite. Between the windows, the wall is constructed of encased insulating board to which is cemented a ⅜-inch sheet of flat Transite to form the exterior surface, giving a modern effect.

Use of this material provides fireproof walls which not only are incombustible, but also are capable of withstanding high temperatures.

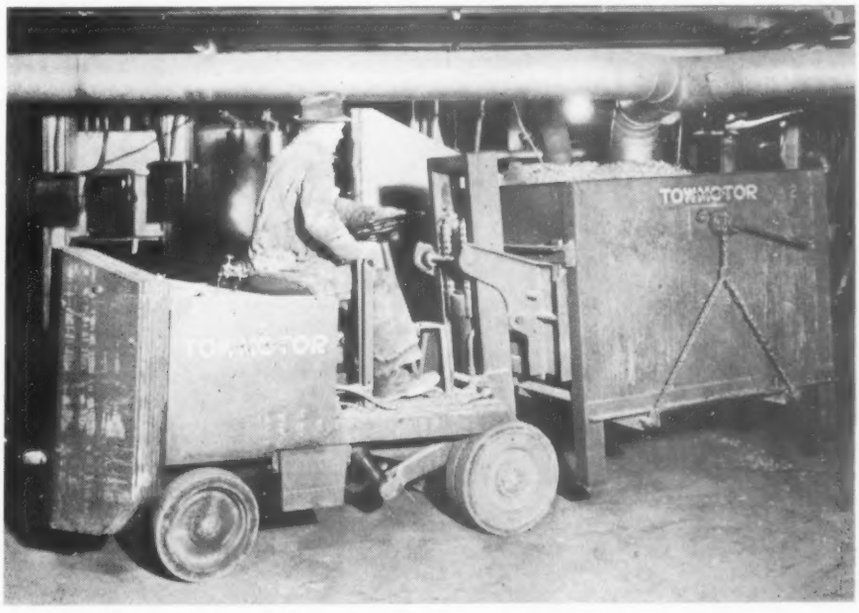
Tests show that a 1-inch thickness of insulating board encased in this manner affords the same insulating value as a 14-inch thickness of common brick, and yet weighs approximately one-twentieth as much.

Units of the curtain wall are held against steel framework of a building by cadmium-plated bolts, and gray caulking compound is applied to the edge of each sheet. Since thermal expansion of Transite is approximately the same as that of steel, no expansion joints are necessary. In erecting the wall only carpenter's tools are required, as the material is easily sawed and drilled.

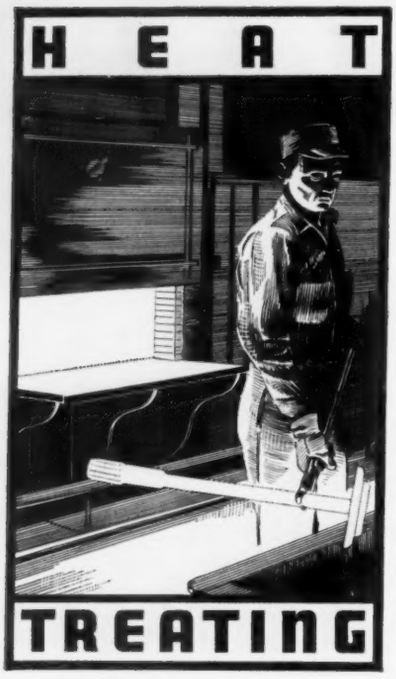


Units of this industrial wall are held against the steel framework of a building by means of cadmium-plated bolts

Truck Handles Scrap In Special Hopper



■ **This gasoline powered lift truck handles heavy load of scrap by lifting mechanism which fits special hopper. Hydraulic cylinders operate the lift and tilt. Truck, lifting mechanism and hopper are of welded steel. Photo courtesy Towmotor Co., Cleveland**



Stoker Firing

Coal burning furnace with three sections provides heat for hot wash, preheat bath and hardening salt bath. Accurate control and even penetration result with low cost

■ WILL-BURT STOKERS, employing automatic air control and other advanced features, are made in several sizes and types for use in homes, hotels, laundries, hospitals, large buildings and other commercial applications.

Typical layout shown in Fig. 1 includes plan and side views of the bin-type unit which draws coal directly from the bin and delivers it to the furnace. Gathering screw, which rotates in the bin, and feed screw are forged steel. Development work is now underway whereby these screws are forged in progressive dies, a rod being fed into one end of the machine and completed screw emerging from the other.

Coal screws are driven by continuous feed, automotive type power units as shown in Fig. 2. Three speeds are provided in the larger units. Gears for these units are made and heat treated in plant No. 2, Will-Burt Co., Orrville, O., where the other parts also are made and stoker assembled. Right angle drive at the junction of the bin feed and furnace feed tubes consists of roller chain, sprocket and miter gears. Axis of bin feed screw is below hopper feed screw with shaft extending through to the chain sprocket. Flange and set screw shown in Fig. 3 hold hopper feed screw to drive shaft through self-aligning universal joint.

Shear pin, connecting the drive and the driven parts of the unit, is on outside of power unit and prevents damage to mechanism caused by foreign material jamming the feed screws. Cleanout covers permit removal of obstructions in feed tubes.

Heat treating is an important process in connection with this equipment as gears must be given hard wearing surfaces with tough cores. Similarly, drive shafts, shear pin couplings and collars also require heat treatment to assure proper life and functioning in service. Drive and feed screws must withstand tremendous torques.

Until a few months ago, this work was handled in conventional gas and oil fired heat treating furnaces. However, Will-Burt engineers desired to incorporate the advantages of stoker firing on these furnaces with the result that development work was started. About this time, considerable experimental work was done using a stoker fired dutch oven for testing tuyere blocks used in the fire pot and it was thought that a similar arrangement might work well in a heat-treating furnace. The first model constructed had a container for the washing and cleaning compound in one section and the salt bath was directly over the fire pot. Although this worked satisfactorily, there was a sudden drop in bath temperature upon insertion of work due to the comparatively low temperature of the material to be treated, resulting in some variation of case produced.

Preheating Bath Added

The final design consists of the arrangement shown in Fig. 3 which is similar to the first arrangement with the addition of a preheating bath, use of which assures a uniform case. End of the furnace is about three feet square and the furnace has a length of approximately 12 feet. Stoker hopper is at extreme right. Coal from the hopper is fed through the feed tube under the oil quench tank into the firepot. The salt bath is directly over the firepot. Lining of the furnace consists of firebrick backed up by insulating brick.

The preheat bath is in a second chamber adjoining the firepot. Heated gases pass over the high wall at the left of the first chamber into the second chamber from which they pass into the third chamber containing the washing and clean-

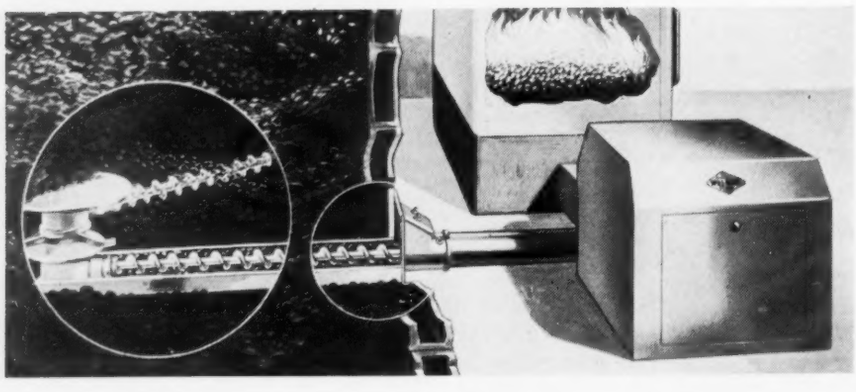


Fig. 1—Typical setup using bin-feed stoker which pulls coal from bin and delivers directly to furnace firepot

Annealing Cycle Time Cut 49%

Production of malleable castings was practically doubled, and annealing time cut from 59 hours to 30 hours in this modern furnace. Built by Surface Combustion Corporation for a large malleable company in Michigan.

Furnace is lined throughout with B&W Insulating Firebrick.

THE BABCOCK & WILCOX COMPANY
REFRACTORIES DIVISION
19 RECTOR STREET
NEW YORK, N. Y.

WRITE FOR BULLETIN R-2-E

BABCOCK & WILCOX

R-6E

ing compound. From here, gases pass up the flue at the extreme left. Diagram does not show details of passages between chambers which were worked out for best transfer of heat to the various elements.

Salt bath is held at 1500 degrees Fahr. by automatic pyrometric

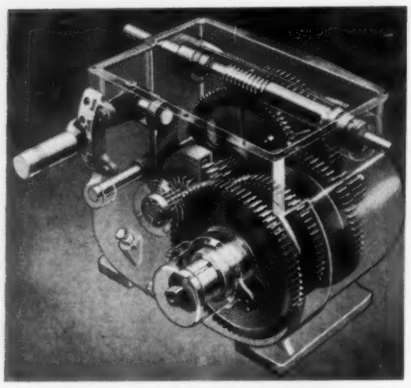


Fig. 2—Automotive type gearbox with three speeds. Shear pin, on hub, extending through case in immediate foreground, protects mechanism in event foreign material jams feed screws

control which actuates the stoker and blower units to maintain this temperature accurately. Preheat bath temperature ranges from 800 to 1100 degrees Fahr. depending upon amount and type of work being handled. As expected, this arrangement has shown high economy as 400 pounds of coal operates the furnace for eight hours. Actual temperature in the fire chamber averages about 2000 degrees Fahr. which is sufficient to burn off all ashes and slag so that it is not necessary to clean the fire. The large mass of heated firebrick together with the quick response obtained by the control assures even bath temperatures under widely varying load conditions.

Oil is kept cool by pumping it through a heat transfer unit in which heat is removed by running cold water. A section of monorail track and a small hoist facilitate handling baskets of work in and out of the various baths.

To hold the fire, the control is snapped to the standby position where an automatic timer causes operation of the furnace for three minutes at the end of every half hour period. Thus it is not necessary to shut down the furnace during holidays or week ends as the fire is maintained with little expense. Temperature can be quickly raised to full operating point in a short time due to wide range in feed and blower capacities provided.

Equipment described is now being used to harden drive shafts, pinions, small cluster gears and other gears for the power units as well as shear pin couplings and collars. These items are made from SAE 1040 steel, giving a tough, strong, resilient core. Heat treatment consists in cleaning in hot water and compound and preheating to 800 to 1100 degrees Fahr. Work subsequently is inserted in salt bath, Holden's Light Case, at 1500 degrees Fahr. for about 30 minutes, and oil quenched. This treatment retains the tough core but raises the surface hardness from about 175 up to between 300 and 370 brinell. Thickness of case is 0.006 to 0.008-inch.

Main advantages of the stoker-fired furnace for this work appear

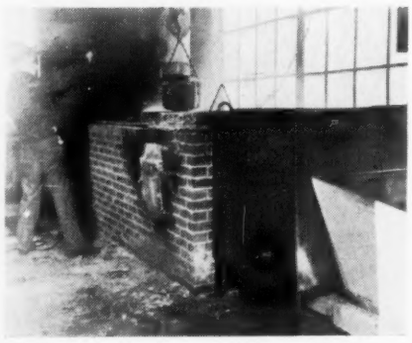
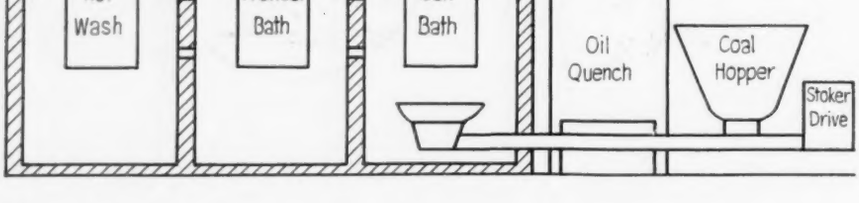


Fig. 4—Showing heat-treating furnace in operation

to be very low fuel cost, accurate control of heat to exacting requirements and an even, penetrating heat at all times.

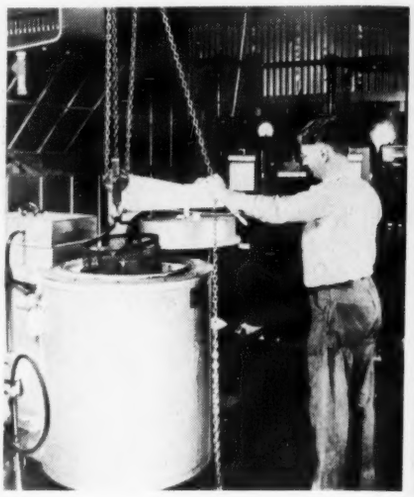
Fig. 3—Layout of stoker-fired, heat-treating furnace



Adds Experimental Heat-Treating Setup to Plant

■ When Acme Steel Co., Chicago, recently installed a new heat treating department, it had primarily in mind the objectives it desired to attain rather than details of the methods by which it would produce properly treated metal.

In pursuance of this policy such matters as correct temperature and



Removing charge from tempering furnace. Quenching bath oil cooled by circulation through radiation unit shown in upper left

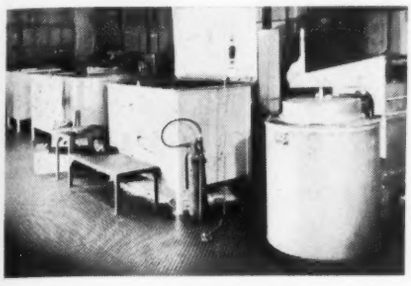
heating cycles were not definitely fixed, and the operating personnel was selected with the view to determine the most effective practice through actual trial and experimentation rather than through previous experience alone. Results have been highly satisfactory. Rejections have been reduced sharply to less than one-half of 1 per cent of total parts treated.

Best known as a producer of strip steel, Acme Steel Co. also is a large manufacturer of equipment used in bracing carload loadings and strapping boxes, crates, etc., for shipment. Strapping tools are necessary to tension and seal the steel reinforcing straps around individual packages or an entire carload of freight. These tools are subjected to hard service, hence it is important that they be of rugged construction but at the same time relatively light in weight.

Until recently, the company maintained heat treating facilities only as a maintenance measure for processing miscellaneous small parts of plant equipment. Strapping tool parts were treated by jobbing concerns. However, the company felt that it could improve quality and reduce rejections by exercising direct supervision over the thermal

processing of its products. Consequently, it was decided to provide furnace equipment and thereby permit control of all of the various steps in the fabrication of strapping tool parts.

Only moderate treating capacity is required, since most of the parts are small. The largest pieces are handles and shear blades, weighing 1½ to 2 pounds. Average weight of the approximately 170 parts constituting the various parts of the tools is about 0.25-pound.



Furnaces, quenching tanks and wash tanks are in line under an overhead monorail conveyor to facilitate handling. Tempering furnace is at right

Furnace equipment installed includes a Leeds & Northrup, atmosphere-controlled, hardening unit, 20½ inches in diameter and 24-inches in depth, inside dimensions. Two Lindberg tempering furnaces, also used for preheating, are employed. Furnaces, quenching bath and washing tank are arranged in line so that they can be served conveniently from an overhead monorail conveyor.

Recording potentiometers provide an accurate check of the heating and tempering operations. Records are filed for future reference of the treatment given each furnace charge. Parts treated include forgings, castings and stampings and involve about 30 different cycles, depending on the material being processed. Tool steel comprises most of the metal treated and consists of about 30 different analyses.

Since many of the parts are small, uniform heating is obtained by careful spacing of individual pieces in the furnaces. In a number of instances this is accomplished by spacing the pieces on a horizontal rod and suspending the latter from the charging basket. This basket is made of nickel-chromium steel.

A.S.M.E. Plans Program For Semiannual Meeting

■ Sessions on iron and steel, surface finishing, welding and cutting, fuels, apprenticeship, and time study, are included on the program for the semiannual meeting of the American Society of Mechanical Engineers at the Statler hotel, St. Louis, June 20-23.

One feature of the meeting will be the Calvin W. Rice lecture to be presented by William Robb Barclay, consulting metallurgist, Mond Nickel Co. Ltd., London, and past president, British Institute of Metals. His address on metallurgical contributions to engineering progress will include a review of the evolution of modern alloy steels, including high speed, corrosion and heat-resisting steels.

Details of the meeting program of interest to the metalworking industry are as follows:

Monday, June 20

EVENING

Time Study

"Practical Applications of Motion-Study Research," by Ralph M. Barnes.

"Wage Incentives," by A. B. Segur.

Tuesday, June 21

MORNING

Boiler Feedwater

"New Method of Boiler Water Treatment for Prevention of Embrittlement," by F. G. Straub and T. A. Bradbury.

AFTERNOON

Calvin W. Rice Lecture

"Some Metallurgical Contributions to Engineering Progress," by William Robb Barclay.

Wednesday, June 22

MORNING

Fuels

"Fuels for Industrial Heating Furnaces," by M. H. Mawhinney.

Apprenticeship

"An Apprenticeship Training Program," by H. L. Humke.

Welding and Cutting

"Oxyacetylene Surface Hardening," by A. K. Seemann.

"Welding Applied to Plant Maintenance and Repairs," by H. R. Wass.

"Arc Welding Costs," by E. W. P. Smith.

EVENING

Banquet

"Engineering and Health," by Dr. Harvey N. Davis, president, A.S.M.E.

Thursday, June 23

MORNING

Surface Finishing

"Report on Standardization Roughness Measurements," by J. R. Weaver.

"Optical Projection, Possibilities and Limitations in Industry," by Henry F. Kurtz.

"Surface Finish Measurements," by E. J. Abbott.

Iron and Steel

"Foundry Maintenance," by William C. Bliss.

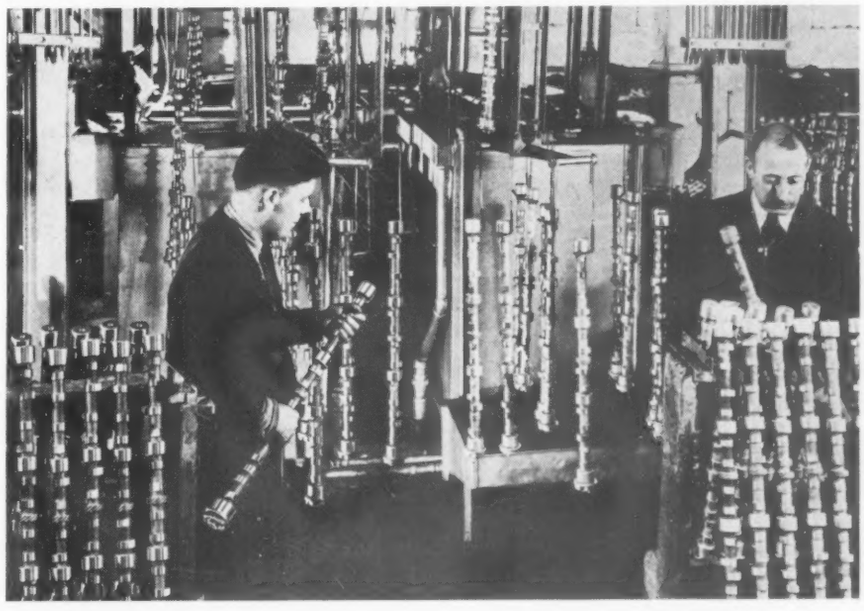
"Some Engineering Aspects of Cast Irons," by Carl Morken.

"Use of Plastic Bronze in Modern Bearing Practice," by C. C. Morgan.

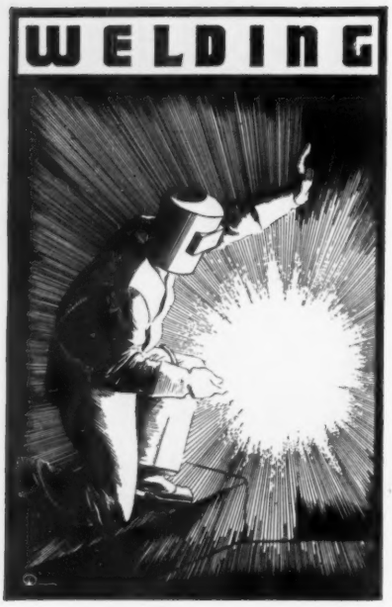
X-Rays Crane Wheels

■ "Double Wall" manganese steel crane wheels originally were introduced by American Brake Shoe & Foundry Co., Chicago Heights, Ill., to replace ordinary single-web crane wheels and minimize possibility of web breakage. Made of 13 per cent austenitic manganese steel, all Amsco "Double Wall" wheels now have the metal structure carefully inspected by means of a 400,000-volt X-ray tube, part of the equipment in Amsco's research laboratory.

Copper Plating Helps Engine Camshafts



■ **Oldsmobile engineers use copper plating on engine camshafts to get quieter engine operation and longer life. Copper plating lowers friction where cams contact hardened steel faces of valve lifters. Added lubricating effect is especially important during run-in period, prevents scoring. Automatic plating machine is shown above**



Hard-Surfacing Alloys

Iron-base electrodes with molybdenum and chromium as alloying elements are used to resurface steel mill rolls which must take a mirror finish when roll is ground

By F. E. GARRIOTT
Chief Metallurgist
J. D. Adams Co.
Indianapolis

■ ALTHOUGH hard-facing alloys have been available in many forms for several years, it is safe to say that industry only within the last year or two has become hard-surfacing conscious. This development has been assisted by the introduction of new inexpensive alloys together with their ease of application by means of welding.

Hard surfacing has been defined as the application of hard-facing alloys by welding in positions subjected to wear to reduce the rate of such wear. Either the electric- arc or the oxyacetylene process may be used. The electric-arc process has been found the most economical and rapid method for applying the alloys to large areas on heavy parts while the oxyacetylene method is used for applying the material to lighter sections where warping and checking are encountered as problems.

Applications of these alloys may take other forms such as cast inserts or parts either welded or held mechanically in the assembly, overlays cast or spun on the part, cold dipping, electrolytic plating, etc. This article deals only with welding as a means of hard surfacing.

The first alloys introduced for hard surfacing by means of welding were expensive and difficult to apply. With the introduction of the iron-base alloys, however, cost of hard surfacing was reduced due to low cost of the material and ease of application. Any welding operator can apply a dense deposit free from cracking with comparative ease either with the arc or the torch. For arc welding, rods are furnished with a flux coating while bare rods are used in the oxyacetylene method of application.

Today, it is common practice in many key industries, such as the steel industry, to design parts of new equipment and machinery with wear and corrosion resistant alloys on the surfaces subjected to excessive abrasion and where lubrication is difficult. Heretofore, hard surfacing has been used mainly for maintenance and in this field it still remains of great importance.

Cost is the main item to be considered in choosing any of the above mentioned methods of applying wear-resistant surfaces to equipment of any kind.

Reduces Repairs

In any machine operation, failure of parts means enforced idleness of the machine. Repair cost, then, includes not only the cost of the new part and replacement costs but also loss of productive time while repairs are being made. Often loss incurred by idleness of the machine is greater than total repair cost. It is impossible to design and construct a machine that will operate continuously without repairs, but through proper selection of alloys on wearing parts the periods of operation between repairs can be greatly increased.

It is usually good practice to resurface parts of machinery several times after they have become worn in service. Often this may be done at less expense than the replacement cost since hard surfacing increases the life of parts from 5 to 25 times that usually obtained from the ordinary steel replacement part. Where a part is resurfaced several times, considerable savings result. Also the cheaper low carbon steels may be successfully substituted for the more expensive alloy steels when the surface is hard faced on wearing areas. This results in bet-

Fig. 1—Experimental pinch roll in temporary, gas-heated brick furnace with rotating mechanism

Twenty great steel lift gates for
BONNEVILLE SPILLWAY DAM

Above—Downstream view of spillway dam which extends from the Washington bank of the Columbia River, across the north channel, to Bradford Island at the extreme left.

Right—Completely erected gate panels—2 of which form a complete gate—on top of spillway piers ready for insertion into guide grooves on the pier sides. View shows upstream face and roller bearings.

BONNEVILLE DAM is a part of the comprehensive plan for power and navigation development of the Columbia River. It comprises a 1300-ft. spillway dam across the north channel, and a power house and navigation lock at the south channel — Bradford Island dividing the river into two channels at this point.

For the spillway dam, here shown, American Bridge Company fabricated and erected 20 vertical lift steel gates, thirteen of which are 50 feet and seven, 60 feet high. Each gate is built in 2 panels (lower 20 feet and upper 30 feet high for a 50-ft. gate) and weighs approximately 260 tons. These gates roll in pier grooves and are operated by direct lift from two gantry cranes which travel on a service bridge.

Bonneville Dam was constructed under the direction of the Corps of Engineers, U. S. Army.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore Boston Chicago Cincinnati Cleveland Denver Detroit Duluth
Minneapolis New York Philadelphia St. Louis

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Fig. 2—Roll partially resurfaced. Spiral arc-welded bead can be seen

ter service at a much lower initial cost.

For hard sufacing by welding, several different types of electrodes are available ranging in price from a few cents a pound to several dollars a pound and the price is usually indicative of the service and life to be expected from the deposited material.

One classification of the various types of electrodes on the market is:

1—High carbon base wire (0.95-1.10 per cent carbon) with a light dipped coating of arc-stabilizing materials for electric welding.

2—Air-hardening alloys. For arc welding, this electrode may have an alloy base wire with an arc stabilizing coating or a high carbon base wire with a heavy coating containing alloying ingredients to be "picked-up" when the metal becomes molten.

3—Manganese and nickel-manganese steel electrodes with a coating to stabilize the arc for electric welding.

4—Iron-base alloys with a coating for arc welding or bare for oxyacetylene welding.

5—Nonferrous alloys.

6—Diamond substitutes.

All of the above types give excellent results if used properly and intelligently within their special range of usefulness. Where severe work hardening, shock and impact is to be encountered or a great deal of build-up is necessary before applying other harder materials, the manganese steels give excellent results. Where the wear resistance is not too severe and shock or impact must be considered, classes one and two may be used economically and to a decided advantage.

Where severe corrosion resistance is a factor or operation at extremely high temperatures, as in the case of cutting tools, nonferrous alloys are most desirable. For extremely severe wear and impact, such as oil well drill bits, diamond substitutes are recommended together with a base or matrix of one of the other types of alloys.

However, for most wear-resisting applications, iron-base alloys have proved most successful, economical and easiest to apply.

There are several different types of iron-base alloys available today for application by welding. Outstanding among these various an-

Fig. 4—Blooming mill spindle hard surfaced by arc welding with an iron-base alloy

alyses are the alloys containing additions of molybdenum with or without chromium.

These molybdenum alloys, due to their high strength, toughness and uniformity of deposit, give excellent wear resistance. Tests made on an Amser wear-testing machine as well as innumerable field tests on all types of equipment, show wear resistance is dependent upon proper adjustment of the carbon and molybdenum in the alloy within certain limits. As either carbon or molybdenum is increased, wear resistance likewise increases. Too much carbon, however, may cause excessive checking and cracking of the resultant deposit. Ingredients must be carefully proportioned and controlled for best service.

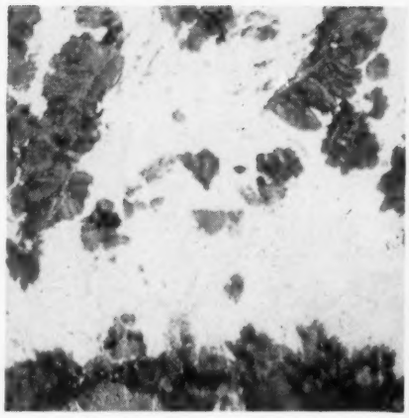


Fig. 5—Micrograph of poor bond between parent metal and welded alloy overlay showing dilution of parent metal. Magnification 500 diameters

Molybdenum and chromium stabilize the deposit by forming complex carbides and solid ferrite solution, increasing strength and toughness of the alloy at high temperatures. These materials have little tendency to gall and seize, due probably to the self-lubricating action of graphite flakes present. Another outstanding advantage of deposits made with these alloys is that they may be heat treated to obtain higher hardness values, further increasing resistance to abrasion. Hardness values of from 50 to 65 Rockwell C may be increased to 62 and 70 Rockwell C by proper heat treatment. Deposits may be hardened by quenching in oil from a temperature of 1600 to 1700 degrees Fahr., depending upon carbon content. Deposits may then be tempered at 400 to 500 degrees Fahr. to increase shock resistance.

If the iron, molybdenum and carbon are adjusted properly in the cast base rod and the coating of the electrode is designed intelligently, the deposit obtained in arc welding is free from cracking and porosity, usually found in deposits of this type.

Electrodes made of these alloys have been developed that can be used to resurface steel mill rolls of various types where a mirror finish is absolutely necessary to avoid scratching or otherwise marring surfaces of the steel sheets passing

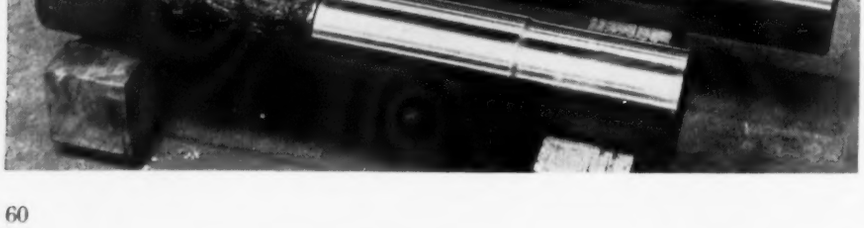


Fig. 3—Finished roll in back illustrates mirror finish possible. Roll in front is half finished—one end ground, the other as welded

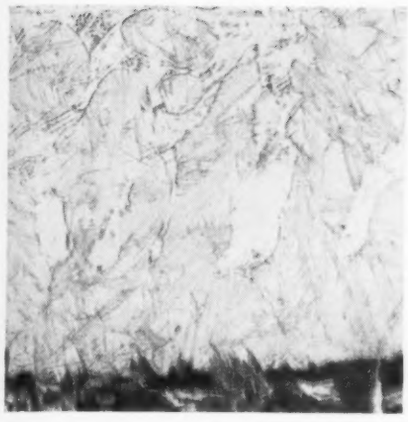


Fig. 6—Micrograph of good bond between parent metal and welded overlay. No dilution is apparent. Magnification 500 diameters

through them. In this application pin holes, gas holes and cracks must be held to the so-called irreducible minimum.

Accompanying illustrations show the method of application and the excellent ground surface of the finished experimental pinch rolls.

The medium carbon steel roll was heated to 700 to 900 degrees Fahr. and rotated in a temporary heating unit constructetd of fire brick shown in Fig. 1. Then hard-facing alloy was applied by arc welding a spiral bead around the roll as it is turned slowly by the rotating mechanism in Fig. 2. To avoid cracking, roll then was allowed to cool slowly to room temperature, either in the furnace or in a box of asbestos or other insulating material. After cooling it was ground and polished to a mirror finish as shown in Fig. 3.

Bond between base metal and overlay was excellent with practically no dilution from the base metal. Dilution is controlled almost entirely by the welding heat and the type of coating on the electrode. Coatings can be designed to give either a low contour, deep penetrating bead with considerable dilution, as shown in Fig. 5, or a high contour bead that is not penetrating but yet produces an excellent bond with no dilution from the base metal, Fig. 6.

Hard-facing alloys in the form of welding electrodes find innumerable uses in the steel-making industry. Some applications of outstanding value are pug-mill paddles, open-hearth charging rams, guides, crusher jaws, blooming-mill spindles (Fig. 4), coal-crusher hammers, limestone-crusher hammers and rolls, punches, dies, tap-hole augers, grizzly bars, gag-press hammers, shear-clutch faces, rolls of various types, etc.

The iron and steel industry is only one of the major industries where hard-surfacing is playing an outstanding role in maintenance and production problems today. There are just as many or more applications to be encountered in all other industries such as cement, coal and coke, excavating, mining, sugar, highway, agriculuture, etc.

♦

Will Publish Bulletins On Porcelain Enamel

■ Ferro Enamel Corp., Cleveland, announces a new publication, the *Ferro Technical Bulletin,* to be prepared by its technical staff and issued quarterly or oftener, as works of importance are completed by the company's laboratories or laboratories of subsidiary plants in other countries. G. H. McIntyre, director of research, will edit the bulletins.

Bulletin No. 1, just published, deals with "Heat Transfer of Porcelain Enamel Metals and Other Materials." It is a report of an investigation conducted by J. C. Bell, one of the corporation's research engineers. Bulletin No. 2, to appear in July, will be on the subject of "Stabilization of Reflectance and Color in Recent Porcelain Enamel."

Paper on Tin-Rich Alloys

■ A paper, "Constitution of Tin-Rich Antimony-Cadmium-Tin Alloys," by D. Hanson and W. T. Pell-Walpole has been published by International Tin Research and Development Council, 149 Broadway, New York, as technical publication Series A, No. 61. Constitution of antimony-cadmium-tin alloys containing up to 43 per cent cadmium and 14 per cent antimony has been established by thermal and microscopic analysis. Results are presented as isothermal diagrams of various surfaces, and as vertical and horizontal sections through the constitutional model.

Three ternary peritectic reactions appear at 227, 209 and 180 degrees Cent. respectively. Metastable conditions occur during cooling in parts of the system, but these have been related to stable state which is obtained by prolonged annealing of specimens.

It is shown that at 227 degrees Cent. tin will dissolve 9 per cent of antimony with 1.5 per cent of cadmium, and at 209 degrees Cent. 5.5 per cent antimony with 2.4 per cent cadmium; below 209 degrees solubilities decrease continuously to 1 per cent antimony with 0.7 per cent cadmium at 148 degrees and to 0.6 per cent of each metal at 20 degrees Cent.

Supplementing this paper is "A Study of the Mechanical Properties of Tin-Rich Antimony-Cadmium-Tin Alloys" by the same authors and same publisher. It is known as technical publication Series A, No. 62. It covers alloys of the same composition range, using annealed chill-cast specimens. Results are correlated with constitution of alloys.

Modern Unit Makes Smackers

■ Novel type electric baking machine, recently redesigned by George W. Walker, industrial designer of Detroit for Smackers Inc., New York, typifies the designer's use of modern materials and finishes. Main section of cabinet is polished stainless steel. Base and top are sand castings to provide weight and stability. Interior holds six electrically heated baking molds

Short Cuts Aid in Fabricating Channels

■ ASSEMBLY of crawler type tractors at Springfield, Ill., plant of Allis-Chalmers Mfg. Co. involves use of a number of 4 to 6-inch channels in the frame as supports for various parts. Fabrication consists in cutting both ends at an angle of 45 degrees and drilling holes in the flanges and web. Stock is received cut to length.

Ordinarily this would be expected to be a simple punching and shearing operation. However, ends on some channels are parallel and on others mitered; in some cases the cut extends the full width of the channel and in others only about half the width, in other words, trimming a corner. Bolt and rivet holes are of varying diameters.

If this were a shearing job a shear would have to be tooled for each width of channel. For mitered cuts, a different setup for cutting each end would be needed, all of which would require double handling. Also, different tooling would be necessary for each type of cut; that is, for full width or only partial width, thus necessitating considerable tool changing and expense.

As the work is of a more or less special nature and does not go through in large quantities, extra tools and tooling, setup and rehandling for both ends would make shearing operations expensive.

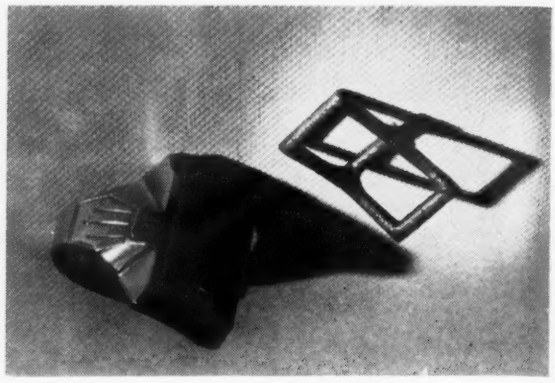
Instead of shearing, two high-speed power backsaws are set at an angle of 90 degrees or 45 degrees to the centerline of the channels which in turn rest on roller slides with an adjustable clamp at the cutting point. With this setup no adjustment for different widths of cut or of channel is necessary. The only adjustment is setting the stop for length. Each saw is cutting on a different piece and the operator alternates from one saw to the other.

On light channels the operator turns the channel end-for-end, and over, if necessary, to get the proper relation of cuts at the two ends. Heavy channels are run straight through, the saw at the left cutting one end and the saw at the right cutting the other. For parallel ends the heavy channel is turned over; mitered ends do not require turning over when both saws are used.

Actual cutting time by the saw is only a little longer than if sheared. The big saving is in eliminating the cost of the different tools, setups and rehandling for the relatively small quantities. Even one piece can be run through the saws, with setting the stop as the only extra expense involved.

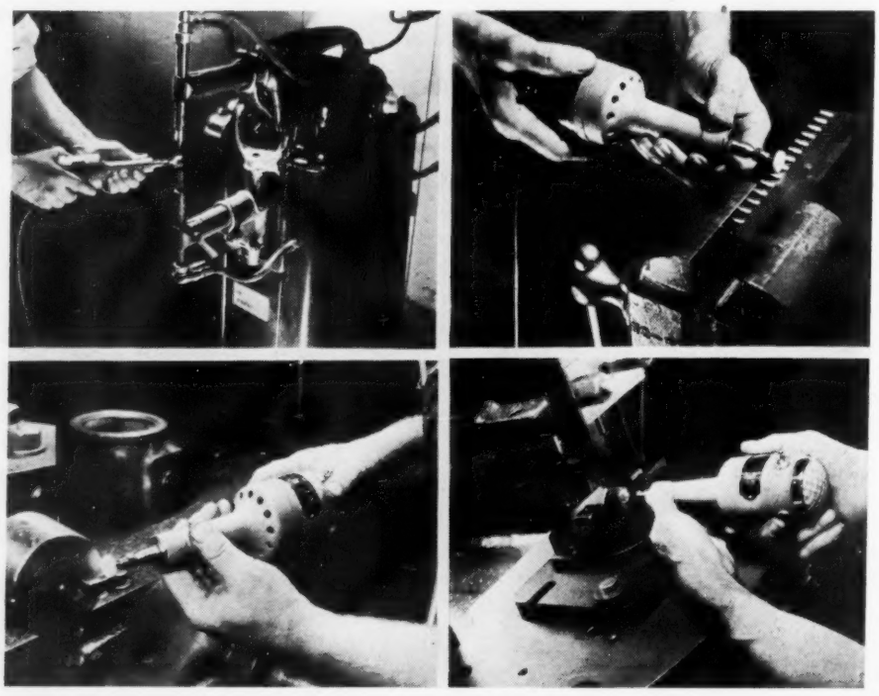
Punching bolt holes in the flanges and web of these channels would require a variety of tooling for the different sizes of channels and holes, and similar rehandling. Instead, this is done on a radial drill with two rotating and indexing jigs mounted on the table, one on each side of the column. The operator sets up the channel in one jig while the other is drilling and alternates back and forth. Drills are easily and quickly changed so two different channels may be in work at the same time, thus not requiring two jigs for each size of channel. The jigs also are somewhat adjustable to meet variations in location of holes.

Lilliputian Buckle Is Malleable Casting



■ In contrast to superlatively large products of metal working industries is this buckle, believed to be the smallest malleable casting ever commercially made. It is 5/8-inch in length, 3/8-inch in width and weighs 1/25-ounce. Thickness of buckle frame is 0.06-inch.

Brings Grinder to Work



■ Small hand grinders eliminate teardowns of costly machine-tool setups here. Upper left, removing corrosion from spot welder points; upper right, sharpening a hedge trimmer blade; lower left, grinding top rake on form tool without having to remove tool from screw machine; lower right, refinishing a worn spot on a punch press forming die right in the press. Photos courtesy Dumore Co., Racine, Wisc.

Enlarges Diesel Line

■ Cooper-Bessemer Corp., Mt. Vernon, O., is offering a complete line of eight standard locomotives for industrial and railway transportation in addition to its diesel-electric locomotives for special purposes. These new standard units range from single-engined, 65-ton switchers of 300 horsepower to twin-engined, 135-ton transfer locomotives of 1500 horsepower.

ELIMINATE TROUBLE
with
Birdsboro Composite Rolls

This 18" x 54" composite Birdsboro roll, part chill and part sand, eliminates slippage in the first roughing passes.

Sand iron for the first passes provides greater traction for the ingot and the chilled section in the balance of the passes, insures a fine, smooth surface on bars delivered to the finishing mill.

Like all Birdsboro rolls, it is designed to meet the special requirements of the job. Birdsboro engineers are ready to cooperate with you in developing rolls of any type and size to meet any given condition.

BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY

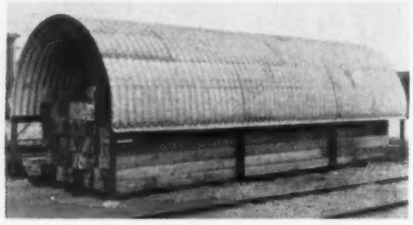
PLANTS AT BIRDSBORO AND READING, PENNSYLVANIA

STEEL CASTINGS • STEEL MILL EQUIPMENT • HYDRAULIC MACHINERY • SPECIAL MACHINERY • CRUSHING MACHINERY • STEEL AND CHILL ROLLS

NEW METAL PRODUCTS

■ American Rolling Mill Co., Middletown, O., has placed on the market an arched iron cover for protecting expensive lumber.

Made of 16-gage galvanized ingot iron, the cover can be easily moved and reassembled. It is 30 feet long with a span of 12½ feet and a rise of 6 feet 5½ inches in the arch. To increase storage space, it is erected on eight uprights of 4-inch pipe. These uprights are notched at the top to take a 20-pound scrap rail,



flange upward. Corrugated sheets are bolted to a 3 x 3 angle which is bolted to the rail. The flare at the bottom of the corrugated sheets is made of a flat galvanized sheet bent outward to shed water.

■ Freeland Sons Co., Sturgis, Mich., is making rowboats of rust-resisting galvanized steel with an extra heavy coating of galvanized spelter. The entire boat is painted inside and out. Sides are stiffened with two beads, channel iron ribs, rigid angle gunwale, and bottom is protected by a rigid steel keel. Two large air chambers form the bow and stern seats. Boats come with the stern strongly braced for motor block, one pair of ores, oar locks, automatic anchor pulley and tie clip. Product is claimed lighter and safer than wood, and waterlogging or leaking impossible.

■ Light-reflecting individual letters and numerals which pick up rays of light and shine out brilliantly in the darkness has been placed on the market by Dura Products Mfg. Co., Canton, O.

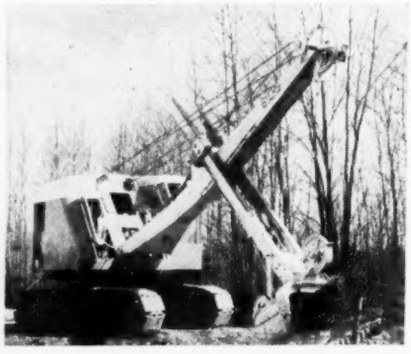
The units are made of solid polished aluminum ¼-inch thick protected with weather resisting lacquer. Light is reflected by means of mirrored glass jewel lenses which are cemented on the letter or numeral. These units may be obtained in sizes from 3 to 5 inches in height. Rustproof screwnails are furnished for mounting.

■ A new ¾-yard shovel weighing 36,000 pounds and convertible to nearly all boom attachments has been placed on the market by Byers Machine Co., South Sycamore street, Ravenna, O.

The unit, known as the 83 model, has had its line and swing speeds stepped up to increase the number of digging cycles per minute. Preformed rolled steel construction provides strength to safely handle the extra power incorporated. Its lighter overall weight more closely approaches highway load limits, making moving easier and less expensive and at the same time reducing ground bearing pressure. Shovel working range has been increased by long boom and dipper sticks, and oversize clutches and brakes make full dippers easy to handle at wide radii.

The unit is powered by a 72 horsepower gas or diesel motor, with major shafts journalled in antifriction bearings. Deck machinery is balanced far back of the center line of rotation with the boom loads and swing strains absorbed by four hook rollers which ride on a roller path of wide diameter.

The new shovel is supplied with crawler treads 20 inches wide



of the single driving type, and it can swing while traveling, steering and hoisting.

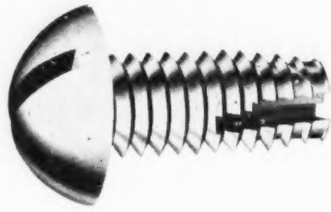
■ Aluminum alloy shovels which are light in weight, acid-resisting, noncorrosive and nonsparking have been placed on the market by Wood Shovel & Tool Co., Piqua, O.

According to the fabricators the shovels have a special advantage to meat-packing, dairy and other food industries and also are ideal for chemical plants, oil refineries, coal mines, paint factories and other industrial applications where fire prevention is important. The shovels come in seven different models, built in sizes to suit varying requirements.

■ A thread-cutting screw, known as the Hi-Hook, has been placed on the market by Shakeproof Lock Washer Co., 2501 North Keeler avenue, Chicago.

The screw has a specially designed double width slot which gives an acute cutting edge that cuts a sharp thread in all types of plastic compositions. This construction reduces the high driving torque normally encountered and enables fast, easy driving with a minimum of breakage.

Because the screw cuts a standard

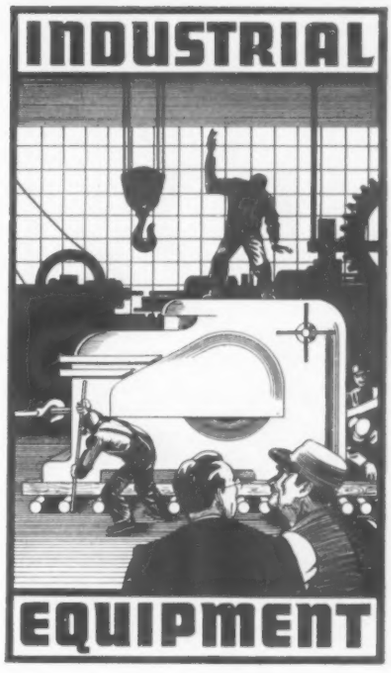


thread, it may be replaced if necessary by a conventional machine of the same size without damaging the hole. The need of a separate tapping operation or threaded inserts is eliminated, the only requirement being that the screw be inserted in a molded or drilled hole of the proper size and driven home with a hand or power driver.

■ Construction Equipment Co., 1235 Beardsley avenue, Elkhart, Ind., has added to its line four new models of mechanically operated combination shovel attachments for use with Case, Farmer's Co-op, Fordson and International tractors.

By a simple change, these devices provide digging, loading, transporting, backfilling or hoisting operations in one machine. Power is taken from the front end of the tractor crankshaft by a special hub hook-up and is transmitted through double roller chain to the control mechanism mounted above the engine housing, giving independent operation. Shovel may be dumped into a truck more than three feet forward of the tractor, and at a height of 7½ to 8 feet 4 inches.

Standard shovel is of ½-yard capacity, and is controlled with a cam latch, without fingers, on an independent lever close to the driver. Clutch and brakes are operated by one lever. The units have hardened alloy steel renewable lips affixed to digging edges.



Gas-Electric Unit Provides Longer Life

■ Ready-Power Co., 3826 Grand River avenue, Detroit, has placed on the market a standard model gas-electric industrial truck which is said to provide longer life with reduced maintenance.

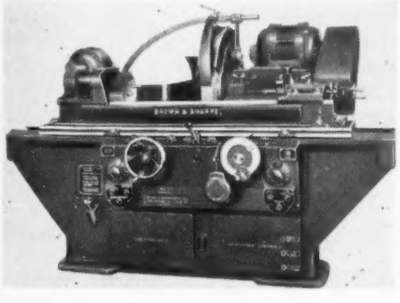
The model comes in 36, 48, or 60 volts, and is built around a Continental engine of four cylinders developing 22.5 horsepower at 1000 revolutions per minute.

Features of the unit include dual belt-driven fan and water pump, fully enclosed magneto drive assembly, low pressure oil filter, new air cleaner and a new Syncotrol idling governor and improved carburetor. Belt slippage is said to be greatly reduced on the fan and pump drive.

The governor, it is claimed, automatically maintains a constant voltage under load, and gives automatic idling at no load. It is arranged to give a range of four operating speeds electrically without changing the governor spring adjustment. Improved Bosch high tension inductor type magneto is used and is dustproof, waterproof and tamperproof. Other features include a more compact muffler and improved cooling system.

Grinds Cylindrical Parts On Production Basis

■ Brown & Sharpe Mfg. Co., Providence, R. I., has placed on the market a new 20 series of plain grinding machines which are operated entirely by electrical control, and are designed for cylindrical grinding of medium large parts on a production basis.



Operating functions of major units of the machines are governed by various selector switches and control knobs which are grouped at the front and within easy reach from operating position.

A feature is that once the units have been set for a given job, they can be controlled entirely by the cross feed handwheel. Two control knobs provide for manual operation. Turning the table knob starts and stops table movements; when desired, pressing down the knob will cause the table to stop at the end of its path of travel.

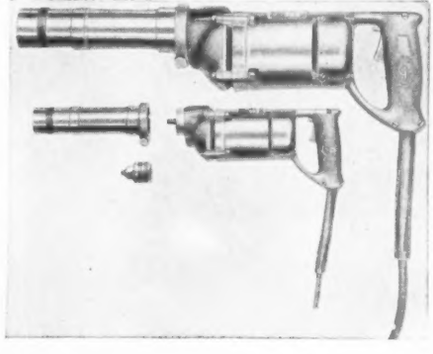
Headstock knob controls both the headstock and coolant pump, and by means of a selector switch, this knob can also be made to start the table movement. During inspection, headstock knob serves to stop flow of coolant without affecting the headstock rotation. This same control can be used to jog or rotate headstock slightly in loading and removing work.

Headstock speeds range from 80 to 320 revolutions per minute, and rates of table travel are in two ranges; 15 to 60 inches and 75 to 300 inches per minute. Headstock and table are driven by separate direct current motors, controlled by rheostats which provide desired rate within the above limits.

Wheel spindle is driven by multiple V-belt from a motor mounted on the wheel slide change sheaves, giving rates of 825 and 1035 revolutions per minute

Lock Collar Converts Drill into Hammer

■ Chicago Pneumatic Tool Co., 6 East Forty-Fourth street, Chicago, has introduced a 5/16-inch heavy duty electric drill that can be converted into a self-rotating hammer drill of ½-inch capacity for concrete, brick or stone.



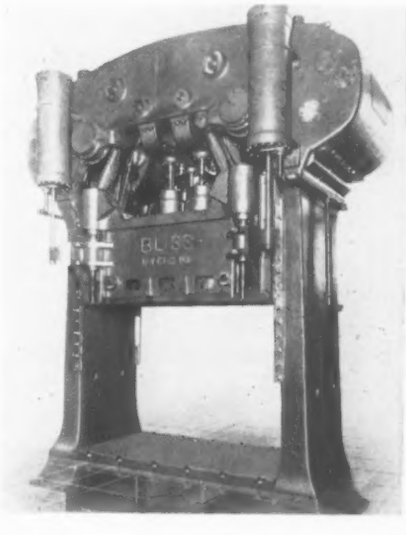
Conversion of the drill into a hammer is made by applying a lock collar to stop rotation. Included with the drill is a 3-conductor cable and plug, 5/16-inch key chuck, one drill steel as selected, drill steel holder and drift, hand clamp, rotation lock and spring, grease gun and 5/16-inch socket wrench. The unit has an overall length of 18 inches, weighs 11½ pounds and is capable of striking 2700 blows per minute.

Huge Press Designed For Drawing Auto Tops

■ E. W. Bliss Co., 1420 Hastings street, Toledo, O., has placed on the market a four point toggle press designed for drawing large automobile body panels, one piece steel auto tops and similar stampings, and being easily converted to single action operation for blanking work.

From the illustration, an idea of the massive size of the press may be obtained together with the fact that the distance between the uprights is 180 inches, and that the area of the 8-inch thick bolster plate is 100 inches front to back by 180 inches right to left. Two crankshafts running front to back have a diameter of 12 inches at the bearings and 16 inches at the crankpins.

The press has six hydro-pneumatic cushions in the bed, having a capacity of 200 tons, and when used in conjunction with the press operating for double action, gives triple action results. These cushions are fitted with locking devices that will lock the pressure pads down until plunger has returned far enough to avoid distortion. The action may be timed to release the cushions at any portion of the up-



stroke of the plunger and cushions released separately in any order desired.

Gearing is of steel and the reduction is such as to drive the press at either 3½ or 5 strokes per minute by means of a two speed 25 horsepower motor. A central control panel is arranged to give several optional methods of operation.

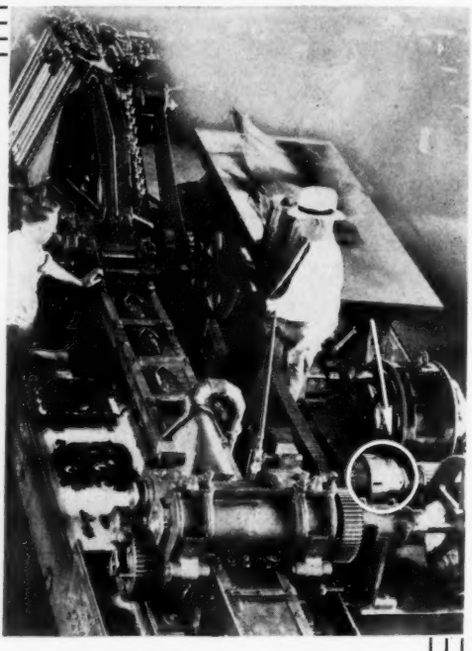
Hoist Utilized For Many Jobs

■ Coffing Hoist Co., Danville, Ill., has introduced a hoist which can handle loads from ¾ to 15 tons and can be utilized in almost any enterprise which requires pulling.

The hoist is compactly built and can be obtained in sizes weighing from 14 to 150 pounds. It is built on the principle of the ratchet and pawl.

A push button control has been incorporated to give the hoist an added safety feature. The device is so incorporated as to automatically and positively lock the handle should the operator's hand slip off. Two other safety stops prevent the handle from whirling around and causing damage. An intermediate locking pawl works alternately and intermediately with the main locking pawl and enables load to be stopped in locking position at half the length of the regular stroke. This also serves as a safety device.

In excessive overloads, hazards are definitely avoided since the safety valve handle bends before any other part of the hoist will give, serving as a warning to prevent chain from breaking or hooks from straightening out and dropping loads.



Stearns Magnetic Clutch (indicated by arrow) was found most efficient for controlling the operation of this intricate lath making machine.

For dependable, smooth acceleration with positive, yet simple, remote or near control, specify STEARNS High Duty Magnetic Clutches.

Made in a wide range and variety of sizes, there is a STEARNS Magnetic Clutch for every problem. There is also a STEARNS engineering service of reliable information, based on many years of practical pioneering experience in the development of magnetic friction devices, available to you.

Consult the largest exclusive builders of magnetic equipment on your control problems, whether in your plant or your products. Write for our catalog on Magnetic Clutches, Clutch-brake Combinations, and Magnetic Brakes.

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SEPARATORS DRUMS ROLLS HIGH STEARNS DUTY CLUTCHES BRAKES MAGNETS
LARGEST EXCLUSIVE BUILDERS OF MAGNETIC EQUIPMENT
650 So. 28th Street Milwaukee, Wis.

Automatic Benders Controlled Hydraulically

■ Wallace Supplies Mfg. Co., 1310 Diversey Parkway, Chicago, has introduced a No. 500 series of automatic tube bending machines designed for general bending work and available in 44 production ranges.

Capacities of these steel, electric arc welded units range from ¼-inch pipe to 8-inch extra heavy pipe. They are hydraulically controlled. Valves are located within the oiltight body and operations controlled by 2 hand levers or pilot valves. Productions range from 300 or more bends per hour in machines having capacities of 2 to 3-inch tubing with production of 4 bends per hour on 8-inch extra heavy pipe.

Hydraulic cylinders of the unit have no gaskets or packings on the work end of the cylinders. Extra length Cheveron type packings provide a leak proof stuffing box. All hydraulic working parts are enclosed within the steel base.

Coal Cleaning System Turns Sand To Fluid

■ Stephens-Adamson Mfg. Co., Aurora, Ill., has placed on the market a new design of its air-sand unit for dry cleaning coal.

Fine sand is made fluid by air bubbling through it continuously as it flows through the cleaner. The coal floats in the stream of dry, air-fluidized sand which spreads the coal in a thin layer and gives almost instantaneous float and sink separation of dirt, impurities and coal.

Regulation of the air supply controls the specific gravity of the fluidized sand to permit float and discharge of desired grades of coal. This dry cleaning system, it is

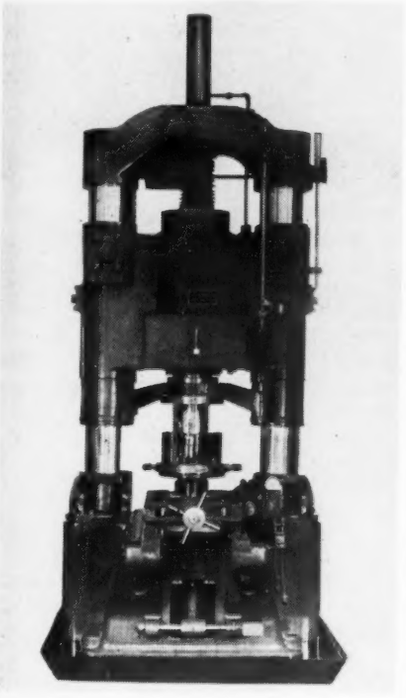
claimed, avoids coal losses in cleaning and provides dry coal thus preventing it from freezing in the car in cold weather. The new system has a greater capacity and also a new method of returning the sand for reuse.

Tapping Machine Has Free Floating Chuck

■ William K. Stamets, Jenkins Arcade building, Pittsburgh, has placed on the market a new tapping machine for tapping oil field pipe couplings. In these units the upper structure is supported by two ground cylindrical columns which serve, in effect, as ways on which the head travels.

The head has rapid traverse in both directions and feed for tapping is obtained by means of an accurately ground lead screw having a coarse thread. The lead screw is located directly in line and forms a rigid column with the spindle. The machine is provided with a free floating chuck for holding the coupling to be tapped, the couplings having been previously accurately bored and faced.

In chucking, the finished face of the coupling is placed in the machine on a surface plate which is



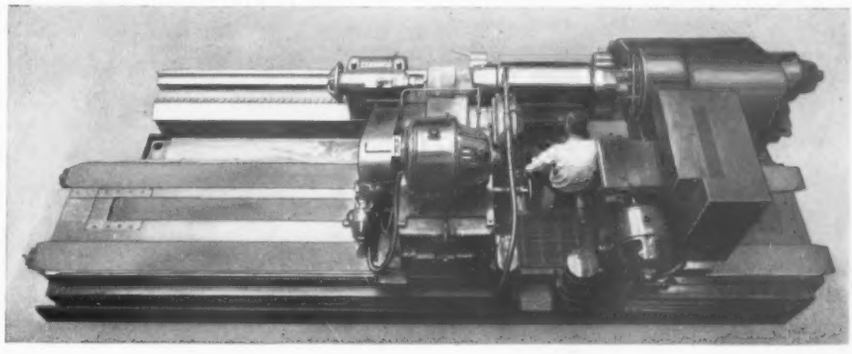
normal to the center line of the spindle. The chuck is then advanced by means of an air cylinder until the coupling is approximately in line with the tap. As the tap enters, coupling is free to float into alignment. After one end of the coupling is tapped the chuck retreats and the coupling is ejected and reversed in the chuck. After the coupling is chucked the operation of the machine is automatic including the tripping and resetting of the tap. For greater accuracy a lead compensator has been developed. The unit can also be furnished with a floating chuck for holding the coupling on the finished ends only, instead of on outside diameter.

Industrial Fans Cover Large Area

■ South Bend Air Products Inc., 322 East Colfax avenue, South Bend, Ind., has placed on the market an improved line of Dynaflow and Aerospot fan units for industrial plant ventilation.

Units of the former type are offered with 2, 4 and 6 blades and in sizes from 16 to 36 inches in diameter, having air deliveries from 1240 to 26,000 cubic feet per minute, and the latter in sizes of 20 to 36 inches in diameter which throw cooling air at distances from 50 to 75 feet.

The fan blades of the units are designed to produce uniform air velocity across the entire working portion of the fan disk. Blades are made of aluminum alloy drop forgings. Intake rings are provided to prevent back flow.



ROLL FINISH *and* CONTOUR

The Farrel crowning and concaving attachment produces a mathematically accurate curve of correct shape for either a crowned or concaved roll, exactly symmetrical on both halves of the roll. The same setting invariably produces exactly the same curvature and permits fixed, uniform and easily controlled accuracy of contour in all rolls.

The finish of roll surfaces and the accuracy of crown shape are important factors in the rolling of sheet and strip with the quality of surface smoothness and the uniformity of gauge demanded by modern requirements.

Many rolling mill operators insure the quality of their output by grinding their rolls or having them ground in Farrel Roll Grinders. These machines are designed to grind rolls of any material to any desired finish which can be obtained with wheels at present available, with a perfect surface free from marks of any kind and with straight, concave or convex contours ground to exact symmetry and accuracy.

In addition to substantial savings in roll finishing costs and in longer roll life, the control of roll accuracy and finish permits control of the quality of flat rolled products, assures uniformity of gauge and diminishes the quantity of sub-standard product.

Our Bulletin No. 111 describes in detail the various features of design and construction which are responsible for the superior performance of Farrel Heavy Duty Roll Grinders. Copies will be sent free on request without obligation.

FARREL

FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

Handling Ingot Molds

(*Concluded from Page* 48)

tions to effectively spray all different sizes of molds.

Due to the necessity of employing several different sizes of molds in order to make the variety of sizes of ingots and billets for rolling into structural shapes and sheets, there arose the problem of handling them all without requiring a special lifting unit for each size.

By taking advantage and using the variable opening range on the special lifter, this requirement was met in a very satisfactory manner.

It will be noted in Fig. 3 that the two hooks from the crane are rather closely spaced, and it may bring up a question as to the reason for use of the double hook arrangement. The explanation is that this eliminates the possibility of sideway twisting of the lifter and load.

Engineering Text on Materials and Processes

■ *Engineering Materials and Processes*, by William Howard Clapp and Donald Sherman Clark; 543 pages, 5¼ x 8¼ inches, 371 illustrations, flexible binding; published by International Textbook Co., Scranton, Pa.; supplied by STEEL, Cleveland, for $4.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A one-semester treatment of the subject, this volume gives a brief treatment of the physical properties and uses of the principal engineering materials and a description of methods by which they are processed. Each chapter is followed by questions for the student and a group of references to be used as source material.

This text has been prepared with the idea of presenting in concise form information which is essential to engineers whose work is primarily using materials. Development of engineering courses has brought in so much necessary material that this feature has been crowded back in many cases. The engineer must know his materials, their properties and limitations and how they are made available for use.

The first section is devoted to materials, the structure of metals and alloys, cooling curves and equilibrium diagrams, metallurgy, properties and uses of ferrous metals and alloys, alloy steels, cast iron and the nonferrous metals. Plastics and plastic molding are also treated.

Part II deals with the production of castings, hot working of metals, cold forming, joining of metals, machine shop production methods and description of various machine tools.

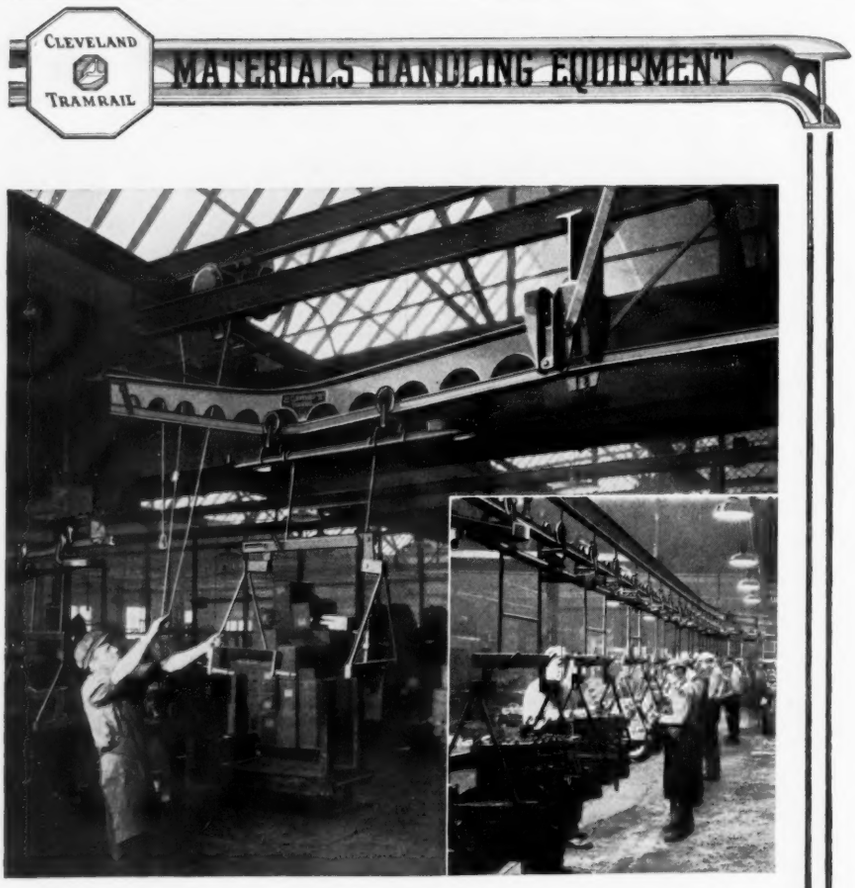
German Institute Issues 1937 Research Reports

■ Twenty-two reports of research work conducted during 1937 by the Kaiser Wilhelm Institute for Iron Research, Dusseldorf, Germany, are now available in bulletin form. These bulletins are in German and furnish information on the chemistry, metallurgy, physics and engineering of iron and steel. Printed in an 8½ x 11⅝-inch size, the reports may be obtained singly, as a complete set or in bound form. A study of the work will convince the reader that the old German thoroughness in research still exists.

Titles of the 22 bulletins and their prices may be had by addressing an inquiry to STEEL.

Glass Insulating Tape

■ New electric insulating tapes, woven entirely from glass yarns, have been developed by Corning Glass Works, Corning, N. Y. Appearing like ordinary textiles these tapes have exceptional insulating properties and chemical resistance as well as ability to withstand high temperatures. Being nonhydroscopic, they deteriorate little with age.



• Cleveland Tramrail as part of the assembly line.

• A lifting beam raises the empty carrier and motor rack above the horizontal to start it by gravity to the head of the line for reloading.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

Listless Steel Market Is Devoid of Feature

Prices Are Steady; Europe Buys Scrap; May Ingots Drop

■ DULLNESS continues unbroken in all departments of the steel and iron market, with no sign of changes within the immediate future.

Buying is confined to a minimum, measured by current needs, and no accumulation of inventory is being done. Volume of orders in June matches closely that of May and April, with a slight downward tendency.

Shipments of finished steel by the United States Steel Corp. in May were 465,081 tons, a decline of 7.3 per cent from April. Cumulative shipments for five months this year were 838,958 tons less than in the comparable period of 1937.

Steel production shows little variation, the national rate last week being unchanged at 25.5 per cent, with indications of continuing at close to that figure this week. Pittsburgh mills increased activity 1.3 points to 19.3 per cent, Youngstown 4 points to 25 per cent and Buffalo 2 points to 23 per cent. Chicago lost ½ point to 22 per cent, the lowest rate since 1934, Eastern Pennsylvania also declined ½ point to 25.5 per cent, Birmingham 11 points to 58, New England 2 points to 25 and Cincinnati 6 points to 16. There was no change at St. Louis at 39.3 per cent, Detroit 18, Wheeling 38 and Cleveland 31.

A carbuilding program by the Pennsylvania, covering more than 1000 units, gives some hope to eastern steelmakers but part of the steel may be taken from supplies now on hand so the tonnage to be bought is problematical. Approval of the Southern railway cars, involving some 80,000 tons of steel, is still withheld and the belief is growing that it may be postponed.

Public works of various kinds continue to furnish almost the only important tonnages in the structural and reinforcing markets. Placing of 8800 tons of shapes for an addition to the government printing office in Washington leads in size. Union Pacific has placed 2425 tons for bridges and Tennessee Valley authority has let 1500 tons of steel transmission towers and 1200 tons of shapes for a powerhouse.

Purchase of scrap tonnage by European consumers, as high as 350,000 tons of No. 1 and No. 2 heavy melting steel being involved, shows how far scrap has receded, the price being reported as $10 and $8.50, respectively, f.a.s. This is about half the figure paid for large tonnages the middle of last summer and about $5 under the second purchase in the fall. This gives dealers a small margin over the New York price and practically none over the Eastern Pennsylvania market. Some scrap at tidewater, held up by difficulties of Japanese credits, may be shipped on these contracts, which call for deliveries over three months.

Steel ingot production in May was 1,806,805 gross tons, 6 per cent less than the 1,925,166 tons made in April and 65 per cent less than the 5,151,909 tons produced in May, 1937. Percentage of capacity engaged was 30.39 in May, 33.44 in April and 88.79 in May, 1937. Average weekly production was 407,857 tons in May, 448,757 tons in April and 1,162,959 in May, 1937.

Automobile production regained in part losses of the preceding holiday week. Assemblies totaled 40,175, compared with 26,980 in the week ended June 4, and 115,900 in the ended June 12, 1937. General Motors produced 17,700, compared with 15,650 the week before; Chrysler made 6195, compared with 5475; Ford, 11,775 compared with 2000; and independents 4505 compared with 3855.

Expected announcement of third quarter prices on galvanized sheets has been delayed beyond expectation and buying is being held at a minimum until uncertainty is removed. Adjustment similar to that in other flat-rolled products is expected. Books have not yet been opened for third quarter on ferromanganese, but no change is expected in the present price.

On the low rate of buying now prevailing prices do not assume much importance and are steady. Last week the composite of iron and steel was unchanged at $38.38 and the finished steel composite at $61.70. On a slight adjustment at Chicago the composite of steelworks scrap lost 4 cents, to $10.71. This is the lowest since July, 1935.

COMPOSITE MARKET AVERAGES

	June 11	June 4	May 28	One Month Ago May, 1938	Three Months Ago March, 1938	One Year Ago June, 1937	Five Years Ago June, 1933
Iron and Steel	$38.38	$38.38	$38.44	$38.50	$38.80	$39.82	$28.71
Finished Steel	61.70	61.70	61.70	61.70	61.70	61.70	45.30
Steelworks Scrap..	10.71	10.75	11.33	11.47	13.20	17.15	9.55

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	June 11, 1938	May 1938	March 1938	June 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.77	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.25
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.25
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.15
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.80
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.90
Bright bess., basic wire, Pitts.	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	37.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	37.00
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	June 11, 1938	May 1938	March 1938	June 1937
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del., Philadelphia	25.34	25.34	25.34	25.26
No. 2 foundry, Pittsburgh	25.21	25.21	25.21	25.21
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	26.215	26.215	26.215	26.135
Malleable Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.77	107.49	107.29

Scrap

Heavy melting steel, Pittsburgh	$10.75	$11.55	$13.65	$18.40
Heavy melt. steel, No. 2, E. Pa.	9.75	10.00	12.75	15.25
Heavy melting steel, Chicago	10.25	11.05	12.20	16.00
Rails for rolling, Chicago	14.75	14.85	15.25	19.50
Railroad steel specialties, Chicago	13.25	13.60	14.25	19.50

Coke

Connellsville, furnace, ovens	$3.75	$4.25	$4.25	$4.65
Connellsville, foundry, ovens	5.00	5.25	5.25	5.30
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Base prices, subject to new extras and deductions, effective to Sept. 30, 1938.

Hot sheet, strip, Pitts.	2.30c
Do., Gary	2.40c
Tin mill black, Pitts.	3.30c
Do., Gary	3.40c
Cold-rolled sheets, Pitts.	3.35c
Do., Gary	3.45c
Cold-roll. strip, Pitts.	3.10c
Do., Worcester, Mass.	3.30c

Prices below also apply until June 30, with old extras and deductions, if giving lower net price.

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.76c
Philadelphia, del.	2.72c
Birmingham	2.47½c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars, dock,	2.95c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.12c
New York, delivered	4.16c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars, dock,	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.20c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars, dock,	3.60c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.65c
Philadelphia, del.	3.77c
New York, del.	3.81c
St. Louis	3.68c
Granite City, Ill.	3.65c

Long Ternes No. 24 Unassorted

Pittsburgh	4.10c
Gary	4.20c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.90c	3.50c
Gary	3.00c	3.60c
Granite City, Ill.	3.10c	3.70c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Mfg. terne plate, Pittsburgh	4.65c
Gary	4.75c
Granite City	4.85c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.55c
Philadelphia, del.	2.44½c
Boston, delivered	2.68c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
St. Louis, delivered	2.54c
Gulf ports	2.65c
Pacific basing points, f.o.b. cars, dock,	2.80c
Do. floor plates	4.05c

Standard Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.52c
Boston, delivered	2.66c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo, delivered	2.37½c
Gulf ports	2.65c
Birmingham	2.40c
St. Louis, del.	2.54c
Pacific coast basing pts., f.o.b. cars dock,	2.80c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Philadelphia, del.	2.77c
Boston, delivered	2.89c
New York, del.	2.81c
Gulf ports	2.85c
Pacific coast basing pts., f.o.b. cars, dock,	3.00c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Detroit, delivered	2.45c
Cleveland	2.35c
Moline, Ill.	2.35c

Buffalo, delivered 2.37½c
Birmingham 2.45c
Gulf ports 2.70c

Iron

Terre Haute, Ind. 2.35c
Chicago 2.40c
Philadelphia 2.67c
Pittsburgh, refined...3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors
Pittsburgh 2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young... 2.50c
Gulf ports 2.85c
Pacific coast ports, f.o.b. car docks 2.95c
Philadelphia, del. 2.77c
Rail steel, straight lengths, quoted by distributors
Pittsburgh 2.30c
Chicago, Buffalo, Cleveland, Birm., Young.... 2.35c
Gulf ports 2.70c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.
Standard wire nails $2.75
Cement coated nails $2.75
(Per pound)
Polished staples 3.45c
Galv. fence staples 3.70c
Barbed wire, galv. 3.40c
Annealed fence wire.... 3.15c
Galv. fence wire..... 3.55c
Woven wire fencing (base C. L. column) 74
Single loop bale ties, (base C. L. column) 63

To Mfg. Trade, base Pitts.-Cleve.

Bright bess., basic wire 2.90c
Galvanized wire 2.95c
Spring wire 3.50c

On above wire items, Anderson, Ind. (merchant products only) and Chicago prices 5 cents per 100 lbs. higher; Duluth (except spring wire) and Worcester up 10 cents, Birmingham (except spring wire) up 15 cents; Pacific coast up 45 cents.

Cut nails, C. L. Pitts. (10% disc. on all extras) $3.60

Cold-Finished Carbon Bars, Shafting

Pittsburgh 2.90c
Chicago 2.95c
Gary, Ind. 2.95c
Detroit 2.95c
Cleveland 2.95c
Buffalo 3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring flats.....0.15
6100 bars 1.20
6100 spring flats 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40
Electric furnace up 50 cents.

Piling

Pittsburgh 2.60c
Chicago, Buffalo 2.70c
Gulf and Pac. coast ports 3.05c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23/16-in.
Pittsburgh 2.40c
Chicago or Gary 2.50c
Birmingham base 2.47½c
Detroit, del. 2.60c
Philadelphia, del. 2.72c
New York, del. 2.76c
Cooperage hoop,
Pittsburgh 2.50c
Chicago 2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland 3.10c
Detroit, del. 3.41c
Worcester, Mass. 3.30c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50...	3.10c	3.30c
0.51—0.75...	4.45c	4.65c
0.76—1.00...	6.30c	6.50c
Over 1.00...	8.50c	8.70c

Commodity Cold-Rolled Strip
Pitts.-Cleve. 3.25c
Worcester 3.65c
Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill..... $42.50
Relay rails, Pittsburgh 20—100 lbs. 32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago... $43.00
Do., rerolling quality.. 42.00
Angle bars, billet, mills 2.80c
Do., axle steel 2.35c
Spikes, R. R. base 3.15c
Track bolts, base 4.35c
Car axles forged, Pitts., Chgo., B'ham. 3.35c
Tie plates, base $46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

Carriage and Machine

½ x 6 and smaller.....65-5 off
Do. larger, to 1-in....60-10 off
Do. 1¼ and larger....60-5 off
Tire bolts .....50 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.
Step bolts .....50-10-5 off
Elevator bolts .....50-10-5 off

Nuts

Semifinished hex.; ½-in. and smaller .....60-10 off
Do., ⅝ to 1-inch.....60-5 off
Do., over 1-inch.....60 off

Hexagon Cap Screws

Milled .....50-10 off
Upset, 1-in., smaller ....70-5 off

Square Head Set Screws

Upset, 1-in., smaller ....80-5 off
Headless set screws.....75 off

Rivets, Washers

Structural, Pittsburgh, Cleveland 3.60c
Structural, Chicago 3.70c
7/16-inch and smaller, Pitts., Chi., Cleve.....65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off Do., less carloads, 5 kegs or more, no discount on any extras.. $3.90
Do., under 5 kegs no disc. on any extras... $4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
11 and 12	59½	49

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch lap weld	59½
12-inch, lap weld	58½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¾ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.89	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..$46.00-47.00
4-in., Birmingham.. 49.00-50.00
4-in., Chicago 57.80-58.80
6 to 24-in., Chicago. 54.80-55.80
6-in. & over, east fdy. 50.00
Do., 4-in. 53.00
Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality
4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.....$37.00
Philadelphia 42.83
Duluth 39.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo... 43.00
Forging, Duluth 45.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago.. 37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown 37.00

Wire Rods

Pitts., Cleveland, No. 5 to 9/32-inch incl..... 47.00
Do., over 9/32 to 11/64-in. incl. 52.00
Chicago, Anderson, Youngstown, up $1; Worcester up $2; Birmingham up $3; Galveston up $6; Pacific coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt. 2.10c.

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.... $3.75
Connellsville, fdry... 4.75- 5.00
Connell. prem. fdry. 5.75- 6.25
New River fdry..... 6.50- 6.75
Wise county fdry... 5.50- 5.75
Wise county fur.... 4.50- 4.75

By-Product Foundry

Newark, N. J., del... 10.88-11.35
Chi., ov., outside del. 10.25
Chicago, del 11.00
Milwaukee, ovens.. 11.00
New England, del... 12.50
St. Louis, del. 11.00-11.50
Birmingham, ovens. 7.50
Indianapolis, del. .. 10.50
Cincinnati, del..... 10.50
Cleveland, del. 11.05
Buffalo, del. 10.50
Detroit, del. 11.10
Philadelphia, del.... 10.65

Coke By-Products

Spot, gal. Producers' Plants
Pure and 90% benzol.... 16.00c
Toluol 22.00c
Solvent naphtha 26.00c
Industrial xylol 26.00c
Per lb. f.o.b. Frankford and St. Louis
Phenol (200 lb. drums).. 16.25c
Do. (450 lbs.) 15.25c
Eastern Plants, per lb.
Naphthalene flakes, balls, bbls. to jobbers..... 6.75c
Per ton, bulk, f.o.b. oven or port
Sulphate of ammonia... $29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., del. Pittsburgh 107.77

Spiegeleisen, 19-21% dom.
Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 106.50
2% carbon 111.50 1% 121.50
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.70-1.75

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrotitanium, c. l., prod-plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, f.o.b. Niagara Falls, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.80
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, f.o.b. Niagara Falls, ton $74.00
Do, spot 79.00
Less-ton lots, lb. 4.25c

Manganese Briquets, contract carloads, f.o.b. Niagara Falls, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.00
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.50	4.75
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.19	4.19	3.89	3.89	5.49	3.94	4.69	5.34
Detroit	3.94	4.19	4.19	3.98	3.98	5.58	3.94	4.69	5.43
Cincinnati	4.08	4.28	4.28	3.98	3.98	5.58	4.03	4.78	5.43
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.40	4.65	4.65	4.30	4.30	5.90	4.10	4.85	5.50
Memphis	4.35	4.55	4.55	4.25	4.25	5.91	4.30	5.05	5.70
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	6.03	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.86	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.81	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.91	4.56	4.28	7.81	6.36	6.11	9.01	....	....
Baltimore	....	4.55	4.15	...	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.82	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.80	4.30	4.09	7.92	6.47	6.22	7.74	8.90	7.45
Cincinnati	....	4.53	4.10	7.94	6.49	6.24	9.34	8.95	7.50
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.46	4.85	....	....	....	....	....	....	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, June 9

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons: **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.22 5 10 0	$14.96	1 17 0
Basic bessemer	....	17.99	2 4 6
Hematite, Phos. .03-.05	32.18 6 10 0	.....	.....
Billets	$38.98 7 17 6	$43.46	5 7 6
Wire rods, No. 5 gage	55.81 11 5 6	41.43	5 2 6
Standard rails	$50.12 10 2 6	$44.28	5 15 0
Merchant bars	2.44c 11 0 0	1.93c	5 5 0
Structural shapes	2.36c 10 12 6	1.78c	4 17 6
Plates, †¼ in. or 5 mm.	2.87c 13 0 0	2.24c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.56c 11 11 3	2.61c	7 2 6*
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.20c	8 15 0
Bands and strips	2.94c 13 5 0	2.01c	5 10 0
Plain wire, base	4.33c 19 10 0	2.24c to 2.66c	6 2 6 to 7 5 0
Galvanized wire, base	5.17c 23 5 0	2.87c to 2.97c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.56c to 2.74c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.01 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$26.98 5 9 0(a)	$16.56	598	$16.06	475	$25.30 63
Basic bess. pig iron	24.75 5 0 0(a)	.....	...	.....	...	27.91 (b) 69.50
Furnace coke	8.04 1 12 6	5.68	205	7.27	215	7.63 19
Billets	38.98 7 17 6	23.27	840	29.07	860	38.75 96.50
Standard rails	2.25c 10 2 6	1.50c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.71c 12 4 0††	1.40c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.45c 11 0 6††	1.37c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.60c 11 14 3††	1.76c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.50c 15 15 0§	2.03c	1,565‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.11c 18 10 0	2.93c	2,250	4.43c	2,950	6.66c 370
Plain wire	4.33c 19 10 0	2.16c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.87c 12 19 0††	1.57c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 65.59 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Bos. dock No. 1 exp.	9.00- 9.50
N. Eng. del. No. 1	9.00
Buffalo, No. 1	10.50-11.00
Chicago, No. 1	9.75-10.25
Chicago, auto, no alloy	8.50- 9.00
Chicago, No. 2 auto	7.50- 8.00
Cincinnati	7.75- 8.25
Cleveland, No. 1	9.50-10.00
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1	11.50-12.00
Eastern Pa., No. 2	9.50-10.00
Federal, Ill.	9.50-10.00
Granite City, R. R.	10.00-10.50
Granite City, No. 2	9.25- 9.75
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
New York, No. 1	†9.00
N. Y. dock No. 1 exp.	8.50
Pitts., No. 1 (R. R.)	12.00-12.50
Pitts., No. 1 (dlr.)	10.50-11.00
Pittsburgh, No. 2	9.50-10.00
St. Louis, R. R.	10.00-10.50
St. Louis, No. 2	9.25- 9.75
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dlrs. No. 1	9.00
Valleys, No. 1	11.00-11.50

COMPRESSED SHEETS

Buffalo	8.50- 9.00
Chicago, factory	8.75-9.25
Chicago, dealer	8.00- 8.50
Cleveland	9.00- 9.50
Detroit	7.00- 7.50
E. Pa., new mat.	11.50-12.00
E. Pa., old mat.	8.00- 8.50
Los Angeles	12.50-13.00
Pittsburgh	10.50-11.00
St. Louis	5.50- 6.00
Valleys	10.00-10.50
Cincinnati, del	7.25- 7.75

BUNDLED SHEETS

Buffalo, new	8.50- 9.00
Buffalo, old	7.50- 8.00
Cleveland	6.50- 7.00
Los Angeles	11.00-11.50
Pittsburgh	9.50-10.00
St. Louis	4.75- 5.25
Toronto, dealers	6.00

SHEET CLIPPINGS, LOOSE

Chicago	5.25- 5.75
Cincinnati	3.25- 3.75
Detroit	4.75- 5.25
†Los Angeles	3.75- 4.00
St. Louis	3.50- 4.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	15.50-16.00
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	15.00-15.75
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	14.50-15.00
St. Louis, 2 ft. & less	13.00-13.50

STEEL RAILS, SCRAP

Boston district	†9.00
Buffalo	12.50-13.00
Chicago	10.00-10.50
Cleveland	14.00-14.50
Pittsburgh	14.00-14.50
St. Louis	11.00-11.50
Seattle	16.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†7.00
Buffalo	10.50-11.00
Chicago, net	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Detroit, net	7.50- 8.00
Eastern Pa.	10.50-11.00
New York, fdry	†6.50- 7.00
St. Louis	6.75- 7.25
Toronto, dealers, net	8.00

SPRINGS

Buffalo	14.00-14.50
Chicago, coil	13.50-14.00
Chicago, leaf	13.00-13.50
Eastern Pa.	15.50-16.00
Pittsburgh	14.00-14.50
St. Louis	12.75-13.25

ANGLE BARS—STEEL

Chicago	12.00-12.50
St. Louis	10.50-11.00

RAILROAD SPECIALTIES

Chicago	13.00-13.50

LOW PHOSPHORUS

Buffalo, crops	14.50-15.00
Cleveland, crops	15.50-16.00
Eastern Pa., crops	16.00-16.50
Pittsburgh, crops	15.00-15.50

FROGS, SWITCHES

Chicago	9.75-10.25
St. Louis, cut	11.00-11.50

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	7.50- 8.00
Cincinnati, No. 2	7.75- 8.25
Eastern Pa., No. 1	13.50-14.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	9.50-10.00
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	12.00-12.50
New York	†6.50- 7.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	8.75- 9.00
Cincin., No. 1, deal.	6.25- 6.75
Cincinnati, No. 2	2.00- 2.50
Cleveland, No. 2	5.00- 5.50
Detroit, No. 1, new	6.25- 6.75
Valleys, new, No. 1	10.00-10.50
Toronto, dealers	6.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	4.50- 5.00
Chicago	4.50- 5.00
Cincinnati, dealers	2.25- 2.75
Cleveland	4.50- 5.00
Detroit	3.25- 3.75
Eastern Pa.	6.00- 6.50
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	5.75- 6.25
St. Louis	1.75- 2.25
Toronto, dealers	6.00
Valleys	7.00- 7.50

SHOVELING TURNINGS

Buffalo	6.00- 6.50
Cleveland	5.00- 5.50
Chicago	6.00- 6.50
Detroit	4.00- 4.50
Pittsburgh	6.00- 6.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	4.50- 5.00
Cincinnati, dealers	1.75- 2.25
Cleveland	5.00- 5.50
Eastern Pa.	6.00- 6.50
Detroit	3.75- 4.25
New York	†2.00- 2.50
Pittsburgh	5.50- 6.00
Toronto, dealers	6.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.00- 9.50
Chicago, elec. fur.	9.00- 9.50
Eastern Pa.	9.50 10.00
St. Louis	8.00- 8.50
Toronto	7.00

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†5.00
Bos. dist. for mills	†6.00
Buffalo	4.00- 4.50
Chicago	4.75- 5.25
Cincinnati, dealers	1.75- 2.25
Cleveland	5.00- 5.50
Detroit	3.75- 4.25
E. Pa., chemical	9.50-10.50
New York	†3.00- 3.50
St. Louis	1.50- 2.00
Toronto, dealers	6.50

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25
Chicago, net	7.00- 7.50

RAILROAD GRATE BARS

Buffalo	8.00- 8.50
Chicago, net	7.00- 7.50
Cincinnati	5.25- 5.75
Eastern Pa.	10.50-11.00
New York	†6.50- 7.00
St. Louis	7.00- 7.50

FORGE FLASHINGS

Boston district	†4.00
Buffalo	8.50- 9.00
Cleveland	8.50- 9.00
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	9.50-10.00

FORGE SCRAP

Boston district	†4.00
Chicago, heavy	14.00-14.50

ARCH BARS, TRANSOMS

St. Louis	11.50-12.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	15.50-16.00
Boston district	†14.00
Chicago, net	15.50-16.00
Eastern Pa.	21.50-22.50
St. Louis	16.50-17.00

SHAFTING

Boston district	†13.00-13.25
New York	†14.00-14.50
Eastern Pa.	18.00-18.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†8.25
Buffalo, steel	14.00-14.50
Chicago, iron	11.50-12.00
Chicago, rolled steel	12.75-13.25
Cincinnati, iron	12.00-12.50
Eastern Pa., iron	14.50-15.00
Eastern Pa., steel	15.50-16.00
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	11.25-11.75
St. Louis, steel	12.75-13.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†10.00
N. Eng. del. No. 2	8.50
N. Eng. del. textile	11.50-12.00
Buffalo, cupola	12.50-13.00
Buffalo, mach.	13.00-13.50
Chicago, agri. net	9.00- 9.50
Chicago, auto	9.50-10.00
Chicago, railr'd net	9.50-10.00
Chicago, mach. net	10.00-10.50
Cincin., mach. cup	9.75-10.25
Cleveland, mach. net	14.00-14.50
Eastern Pa., cupola	14.50-15.00
E. Pa., mixed yard	11.50-12.00
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	12.50-13.00
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, No. 1	10.50-11.00
St. L., No. 1, mach.	12.00-12.50
Toronto, No. 1, mach., net	11.50

HEAVY CAST

Boston dist. break.	†7.25- 7.50
New England, del.	10.50-11.00
Buffalo, break.	10.00-10.50
Cleveland, break. net	13.00-14.00
Detroit, break.	10.00-10.50
Detroit, auto net	11.00-11.50
Eastern Pa.	12.50-13.00
Los Ang., auto, net	13.00-13.50
New York, break.	†8.00- 8.50
Pittsburgh, break.	10.50-11.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	13.00
Buffalo	12.00-12.50
Chicago, R. R.	10.50-11.00
Cincin., agri. del.	9.00- 9.50
Cleveland, rail	11.50-12.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R.	14.00-14.50
Los Angeles	17.50-18.00
Pittsburgh, rail	13.00-13.50
St. Louis, R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†9.50
Chicago	14.50-15.00
New York	†13.50-14.00
Eastern Pa.	16.00-16.50
St. Louis	13.25-13.75

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	13.50-14.00
Eastern Pa.	16.00-16.50
Pitts. (light & hvy.)	13.50-14.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty pd. nom.	$15.75
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. 45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 72

Pittsburgh—Further tapering in sheet mill operations is noted, to around 28 per cent of capacity, against 32 per cent the preceding week. However, much of this decrease is due to the Memorial day shutdowns among independents. Likewise, the jobbing mills were operated at around 20 per cent against 25 per cent in the preceding week, with the Memorial day explanation attached. New sheet business is slow in maturing and mostly is for scattered small lots. Galvanized mill operations are averaging around 39 per cent of independent capacity, unchanged from the preceding week.

Cleveland—Little change is noted in demand for hot and cold-rolled sheets as users buy only for actual needs and for prompt delivery. The trade is awaiting an announcement on galvanized sheet prices for third quarter. Third quarter prices on other flat-rolled products has not resulted in improvement in specifications. Mill operations reflect day to day fluctuations of incoming tonnage.

Boston—While sheet orders from this district are smaller there are a few isolated exceptions. One seller of blue annealed notes a slight increase in demand from small tank fabricators and booked 150 tons in one order for prompt delivery, including some plates. A good part of current volume on cold-finished and other grades is being done with seconds. Jobbers are buying to fill gaps in stock only. Stamping shops continue dull with purchases light.

New York — Sheet buying continues to lag, and while there has been little variation in the daily rate of incoming business this month, most trade interests look for a decline for the month as a whole, compared with May. While there is likely to be some buying of galvanized sheets when the price situation becomes clarified for next quarter, the trend in most consuming lines appears downward.

Philadelphia — Sheet buying is quiet, including galvanized roofing, in spite of the sharp concession noted here recently, pending opening of books for third quarter.

Buffalo—No immediate improvement is expected in the sheet market as automotive specifications continue to lag. The current flow of light buying is diversified.

Cincinnati—Sheet mills are getting a measure of satisfaction from the steadiness in demand. Volume is light with little hope for any considerable upturn soon. That inventories are scant is shown by the large proportion of orders based on promise of rush delivery. Automotive needs are chiefly for fill-in purposes, other specifications being broad.

St. Louis—Sheet purchasing continues in small volume and current orders, according to producers and distributors, are the smallest individually in recent years. The aggregate so far this month, however, is about even with the comparable interval in May, but measurably below a year ago. Miscellaneous demands have tapered to some extent and buying by the large consuming groups is light. Stove manufacturers are relatively the heaviest consumers, several stove foundries having stepped up operations to five days per week in preparation for deliveries in August and September.

Birmingham, Ala.—Production of sheets is at the lowest level of several years. Demand is light and barely steady, a reversal of the usual order for the sheet mill.

Welding
by
SMITH
MAKE old equipment able to perform today's job—you can by Smith's redesigning and welding process! Whether we weld to your specifications or to those we'll prepare based on your requirements, you'll profit by improved products, increased production and lower costs. Write for "Welding by Smith".
S. MORGAN SMITH COMPANY,
YORK, PA.

Strip

Strip Prices, Page 73

Pittsburgh — Both hot and cold-rolled strip mills appear to be holding their own, with new business coming in at a rate that continues fairly steady operations. Hot strip mills operated last week at 16 per cent of capacity, against 18 per cent the preceding week, the slight decrease being due to the Memorial day shutdown. The same explanation is offered for the rate of 18 per cent at which cold mills operated, against 22 per cent in the preceding week.

Bids were opened June 3 by the commanding officer at Rock Island arsenal, Ill., on 430 to 640 tons of strip steel, mostly cold-rolled.

Cleveland—Sellers of wide and narrow hot and cold-rolled strip report little change in current requirements. Announcement of third quarter prices has had no influence in stimulating demand. Consumers continue to order only for actual needs despite the fact inventories are low. June bookings are expected to be lower than in May, due to easing in seasonal requirements.

Boston — Consumer stocks of narrow cold strip are low in most instances but slow fabricating operations restrict buying to fill-in needs with prompt delivery specified. Larger users are buying only for current consumption, most demand coming from well distributed miscellaneous sources. Finishing operations at some mills are down a few points, but one in Rhode Island is still close to 40 per cent of capacity with schedules uneven. The recent $2 reduction brought in no additional volume.

New York — Narrow cold strip buying continues to involve only fill-in needs from miscellaneous consumers. There is practically no advance buying and most orders are small. Incoming volume is slightly under the rate of last month, although the character of business is practically unchanged. Hot strip moves slowly. The recent reduction in cold strip prices has not stimulated buying.

Birmingham, Ala.—Strip, stagnant until the cotton tie season opens, shows no improvement in demand. On the other hand a slight decrease is evident during the week.

Ferroalloys

Ferroalloy Prices, Page 74

New York — Navy department closes July 5 on 122,900 pounds of ferrosilicon, schedule 3753, for delivery to eastern yards, and July 1 on 23,000 pounds of ferromanganese, schedule 3724, eastern yards.

Plates

Plate Prices, Page 72

New York—Approximately 14,400 tons of hull steel will be required for the four cargo vessels recently let by the United States maritime commission to the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. Bids on these boats were opened May 3, with eight others, which were divided equally between the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and the Sun Shipbuilding & Dry Dock Co., Chester, Pa., in the early part of May.

No action is still pending on the four C-3 cargo boats on which bids were opened May 27 for the American Export Lines Inc. These vessels will require approximately 16,000 tons of hull steel and when they are awarded the maritime commission will have placed cargo boats this year, requiring a total of 73,600 tons of steel.

Meanwhile, plate buying is dull and is composed principally of small miscellaneous requirements. The only important railroad requirements are those of the Southern railway for its 5550 cars, but until interstate commerce commission approves the construction contracts the steel cannot be released, and in the opinion of some trade leaders this approval may not come for some time.

Cleveland—Steel plate requirements are generally unchanged this month from the comparable period during May. In a few instances a slight gain has been noted, due to some consumers entering the market after a long absence. Current specifications are limited to actual requirements, although in a few isolated instances some buying for stock is noted. Prices remain firm.

Chicago—Demand for steel plates has been extremely spotty. Sales by fabricators have held up fairly well but producers are moving only small tonnages occasionally. Fabricators are filling orders from stocks, ordering plates only when spot needs arise. At present tanks comprise the bulk of the market.

Boston—Several hundred tons remain to be placed for oil tanks, including projects at Calais and Hallowell, Me., and Chelsea, Mass., sustaining the recent substantial improvement for such plate requirements. Shipyard releases are gradually mounting with a large volume of tonnage looming, on part of which smaller yards will be in a position to compete. Demand for plates by structural and boiler shops is light, few of the latter having backlogs of any size.

Philadelphia — Platemakers are encouraged over the Pennsylvania car and locomotive program and see substantial shipwork ahead. Meanwhile tonnage is light and diversified. Bids on seven 110-foot coast guard cutters have been postponed indefinitely. Bids originally were to have been taken at Washington June 15.

Birmingham, Ala.—Spot business in plates is off from last week. In fact, the current week is described as unusually quiet. Some new bookings, it is believed, are in prospect.

Seattle—Shops lack orders, most pending jobs being for small boilers and tanks. No large projects are in sight. Gjarde Construction Co., Seattle, is low at $83,300 for the general contract for an addition to University of Washington boiler plant and equipment, totaling $150,000. Spokane has called bids June 16 for furnishing 12,500 feet of 25-inch welded steel water pipe and fittings.

Plate Contracts Placed

Unstated tonnage, large-type buoys, lighthouse service, Staten Island, N. Y., to Bos-Hatten Inc., Buffalo, $11,298, delivered; Union Boiler & Mfg. Co., Lebanon, Pa., $13,960, and Tippet & Wood, Phillipsburg, N. J., $11,210; bids May 2.

Plate Contracts Pending

175 tons, water tank, Brookline, Mass.

Unstated, 12,500 feet 25-inch welded steel water pipe and fittings, Spokane, Wash.; bids to C. T. Bogart, purchasing agent, June 16.

Unstated tonnage, steel tank and tower, veteran's hospital, Dearborn, Mich., Steel City Plumbing & Heating Corp., Gary, Ind., low, $24,000; bids June 7.

Unstated tonnage, addition boiler and fuel burning equipment, veteran's hospital, Hot Springs, S. Dak., Chicago Bridge & Iron Co., Chicago, low $22,950; bids June 7.

Unstated tonnage, two 500-cubic yard welded steel dump scows, U. S. engineer, San Francisco; bids June 15, cir. 172.

Bars

Bar Prices, Page 72

Cleveland—Producers of carbon and alloy steel bars report a gradual fall in tonnage, due to further curtailing in operating schedules among farm equipment manufacturers. No improvement is anticipated from this source for about 60 days. Requirements from auto partsmakers and railroad equip-

ment manufacturers are negligible. However, hope of some revival by the latter is held by sellers following Pennsylvania railroad's recently announced program authorizing construction of 1000 gondola cars, eight special type cars and 20 electric locomotives.

Chicago—Demand in general has remained much the same and while some producers have reported slight declines, one interest has seen a fairly encouraging increase the latter part of the week, this from a farm equipment builder.

Boston—Cold-finished bars are slack, due largely to sluggish demand from textile machinery and other tool builders. Forging bars are more spotty with the aggregate volume down slightly. Soft steel material also moves slowly. Makers of bolt and nut specialties are buying fill-in needs only and most have substantial banks of finished goods on hand. Tool steel and alloy bars move in small lots only, but shipyard needs are maintain. Railroads are releasing little tonnage.

New York — Commercial and cold-drawn bar shipments this month are down from the corresponding period of May. Orders are small and miscellaneous. A slight increase is noted in railroad releases for equipment repairs, but this is more than offset by declines in other lines.

Philadelphia — Steel bars are steady in volume of buying and price. Orders are light and well diversified.

Birmingham, Ala.—Except for some comparatively small and widely scattered business in reinforcing bars, specifications are sluggish. Anticipated business from implement producers has not developed.

Pipe

Pipe Prices, Page 73

Pittsburgh — Most activity with wrought pipe mills is confined to seamless tubing in the medium and smaller sizes. Line pipe inquiry seems to have dried up, but there is a restricted demand for the smaller sized butt and lap weld pipe. Pipe mills are operating at about 30 per cent.

Cleveland—Little change is shown in demand for standard steel pipe out of jobbers' stocks. Industrial expansion and repair work is at a minimum and little sign of improvement is seen. A few small municipalities have gas and water line improvement programs prepared and are hopeful of getting federal aid. Cast iron pipe has registered some improvement recently. U. S. Pipe & Foundry Co., East Burlington, N. J., is reported low on 610 tons for a new force main at Mansfield, O. Prices for both cast and steel pipe remain firm.

Boston — Including purchases by Malden, Salem and Boston, Mass., the latter through the procurement office, treasury department, cast pipe contracts approximate 1000 tons, the three above named taking 685 tons, class C and 150. Releases are steady and the district foundry continues on a four-day week schedule. Steel pipe buying is mostly in small lots, but steady with prices generally well held by resellers. Warren Steam Pump Co., Warren, Mass., at $87,000 is low on piping and sewage pumps for the Field's Point sewage disposal plant, Providence, R. I.

Birmingham, Ala.—Pipe plants of the immediate district have held fairly consistently to a curtailed schedule but face further reductions before the end of the quarter. Specialty jobs have contributed substantially to output locally.

New York — Public Service Corp. of New Jersey is taking bids this week on close to 500 tons of gas pipe, the largest utility inquiry in several months. Department of purchase, New York, will ask bids later this month on close to 8500 tons of cement-lined cast pipe, this in addition to 2007 tons opened last week. Buying in other directions is light, although Jersey City placed better than 300 tons with the Phillipsburg, N. J., foundry.

San Francisco — Most inquiries for cast iron pipe are confined to lots ranging from 40 to 80 tons. No awards of size were reported. Largest pending inquiry calls for 1650 tons of 2 to 18-inch pipe for Redding, Calif., up for bids June 15. United States Pipe & Foundry Co. is low on 128 tons of 6-inch pipe for the treasury department, San Francisco. Los Angeles is taking bids on 17,331 feet of 2 and 4-inch pipe. So far this year 13,996 tons have been booked, compared with 16,600 for the corresponding period in 1937.

Seattle — No improvement is noted. Municipal requirements are large and it is hoped allocation of federal funds soon will finance proposed projects. At Wenatchee, Wash., local WPA officials have approved a $282,741 water main project involving 525 tons of 6, 12 and 16-inch cast iron pipe. Bids will not be called for 60 days by Jim Dunstan, city engineer. United Contracting Co., Portland, Oreg., is

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low at $11,991 for a system improvement at Central Point, Oreg., involving 100 tons of cast iron pipe.

Cast Pipe Placed

325 tons, various sizes, Jersey City, N. J., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
105 tons, small sizes, Danvers, Mass., to Warren Foundry & Pipe Co., Everett, Mass.
100 tons or more, balance of year's requirements, Pittsfield, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

Cast Pipe Pending

610 tons, new force main, Mansfield, O.; U. S. Pipe & Foundry Co., East Burlington, N. J., low.
525 tons, 6, 12 and 16-inch, Wenatchee, Wash.; bids probably in August.
500 tons, 4 to 12-inch, Public Service Corp. of New Jersey; bids June 14.
275 tons, 8 and 12-inch, class C, Boston, through procurement division, treasury department.
225 tons, mostly 16-inch, class 150, Salem, Mass.; bids in.
185 tons, 6, 8 and 12-inch, class C. Malden, Mass.; bids in.
128 tons, 6-inch, class 150, treasury department, San Francisco, invitation 5482; United States Pipe & Foundry Co., Burlington, N. J., low.
100 tons, 6 and 8-inch, Central Point, Oreg.; United Contracting Co., Portland, Oreg., low.
Unstated tonnage, 17,331 feet 2 and 4-inch, Los Angeles, specification 3764; bids being taken.

Steel Pipe Pending

Unstated tonnage, thirty 60-foot sections 24-inch i. d. steel discharge pipe; 35 sections, 15-foot 2-inch lengths, 24-inch i. d. shore pipe, delivery Dehli, O., and 125 sections, 15-foot 2-inch lengths, 20-inch i. d. shore pipe, delivery Paducah, Ky., American Rolling Mill Co., Middletown, O., low, bids May 18, U. S. engineer, Louisville, Ky.
Unstated tonnage, 360 sections, 14-foot lengths, 20-inch i. d. (5040 feet) welded steel dredge shore pipe, U. S. engineer, St. Louis, Connery Construction Co., Philadelphia, low at $21.25 per section, delivered, St. Louis; bids May 26, cir. 180.
Unstated tonnage, 168 sections (3024 feet) welded steel dredge discharge pipe, 20-inch i. d., U. S. engineer, St. Louis, Treadwell Construction Co., Midland, Pa., low at $18,312, delivered; bids June 4, cir. 189.

Wire

Wire Prices, Page 73

Pittsburgh — The wire trade continues to languish with only small lots of plain wire and some mesh for highway construction, and scattering small orders for nails, composes much of the finished activity. Manufacturers' wire, which is in only fair demand from other processors, still makes up most of the going mill production.

Cleveland—Demand for manufacturers' wire remains at a low level. Lack of normal requirements by auto partsmakers is keenly felt here and no real improvement is anticipated through the remainder of this month. Specifications for merchant items while still at a comparatively higher volume than manufacturers' wire continues to ease seasonally. Mill operations remain at a slightly lower rate than during May. Mill prices are firm but the secondary market is still unstable.

Chicago — Demand is fair compared with activity in other markets. Although sales of merchant wire have decreased somewhat, business definitely is being done in other lines of wire commodities. Automotive and farm equipment demand, while below normal, still is one of the stronger spots. The road building season, delayed at the start by heavy rains, has pushed over into June considerable buying of wire mesh for concrete reinforcing.

Boston — Producers of some wire specialties have experienced a slight decline in new business with most products unchanged from the slow demand of recent weeks. Most orders are small individually with prompt shipment requested. Mill schedules are irregular in finishing departments, and, although sellers are unable to stock numerous sizes and widths in many specialties, processing schedules are frequently advanced to a point where finishing and shipment is usually prompt. Rod buying is slack and mill operations are irregular. Prices are generally well maintained.

New York — No improvement, with incoming volume barely maintained, marks slow demand for wire and wire products. The number of orders from miscellaneous consumers is fairly large, but all are for small lots. Wire moving to the automobile trade is negligible and other large consuming industries are buying lightly. Finishing mill operations are uneven and barely up to the recent slow rate. Manufacturers' wire is slack, a condition that prevails for practically all products.

Birmingham, Ala.—Wire products show no improvement. Scattered business, mostly in small lots, continues to supply what bookings there are.

Rails, Cars

Track Material Prices, Page 73

Announcement by the Pennsylvania that it will build 1000 gondolas, six well-hole cars and two flats in its own shops opens up possibilities of some 10,000 tons of flat steel, shapes and bars. It is a question how much of this will be taken from the company's own stock. No buying for this purpose

is expected for at least a month. Most of the light steel for 20 new electric locomotives to be built by this road will be bought, it is believed.

Several roads in the Southwest now in receivership are holding back expenditures approved by the court, on the ground that present revenues are too small to justify the outlay. Purchases are being delayed until earnings show an increase.

Placing of 3400 tons of rails with the Colorado mill by the Atchison, Topeka & Santa Fe is its second purchase this year.

Approval of the purchase of 5550 cars by the Southern railroad, by the interstate commerce commission, is still delayed and some opinion is held that it may be postponed indefinitely.

Car Orders Placed

Cornwall railroad, Lebanon, Pa., seven 70-ton air-dump cars, to Austin Western Road Machinery Co., Aurora, Ill.

Rail Orders Placed

Atchison, Topeka & Santa Fe, 3400 tons 131-pound rails, to Colorado Fuel & Iron Corp., Pueblo, Colo.; this is in addition to 3220 tons placed some weeks ago.

Locomotives Pending

Malahat Logging Co., Vancouver, B. C., one oil-burning locomotive; bids asked.

Navy, bureau of yards and docks, one 30-ton diesel driven locomotive, delivery Brooklyn; bids June 24, schedule 3762.

Buses Booked

American Car & Foundry Motors Co., New York: Seven 30-passenger for Des Moines Railway Co., Des Moines, Iowa; one 36-passenger for Campus Travel Inc., New York.

Shapes

Structural Shape Prices, Page 72

New York—New structural inquiry is led by 2600 tons for the Cross Bay boulevard project, Queens, N. Y., closing June 21 and a slight increase in the number of smaller building jobs. Bethlehem Steel Co., Bethlehem, Pa., is low on the Bayonne, N. J., transit shed, taking 1250 tons of fabricated shapes. Purchases of transmission towers, intake gates, power house framing and bridges by the Tennessee Valley authority account for several thousand tons.

Pittsburgh—Some medium sized shape tonnages were placed recently. The largest single lot being 400 tons for gates and bulkhead frames placed by the Tennessee Valley authority and divided between two fabricators. Other awards ranged downward from 300 tons.

Cleveland—Public projects continue to dominate the structural market. Bidding dates are expected to be announced soon for the east and west approaches for the Main street bridge, each involving 2700 tons of structurals and 2150 tons of reinforcing bars, and also for the Cloverleaf highway development near Brecksville, O., involving 1337 tons. Bids went in late last week for approximately 800 tons of sheet piling for a breakwater development at Fairport, O., and 140 tons for administration building at Andrews school, Willoughby, O. Fabricated prices continue weak.

Chicago—Inquiry is light, but a downward trend is not generally indicated as inquiries have varied greatly over the past few weeks. Bethlehem Steel Co. has booked 190 tons for a highway bridge in Waterloo, Wis. There is a 500-ton inquiry for a coal tipple at Danville, Ill. Usual miscellaneous smaller tonnage inquiries are absent.

Boston—Small bridges account for most pending structural steel being estimated, Massachusetts closing June 21 on a stringer span at Peabody. Since the first of the year that state has purchased less than 500 tons of bridges. Bids are in with the Boston elevated railroad for a 1500-ton machine shop at Everett, Mass., but most building inquiries are for small tonnages. More contracts for 30 to 50-ton lots have been placed, but fabricating shops in this district, with one exception, have little or no backlog.

Philadelphia—Structural buying is featured by an award of 8800 tons treasury printing building, Washington, to Bethlehem Steel Co., Bethlehem, Pa. Locally 550 tons for

Shape Awards Compared

	Tons
Week ended June 11	**25,200**
Week ended June 4	**10,657**
Week ended May 28	**6,550**
This week, 1937	**15,403**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**15,483**
Weekly average May	**8,963**
Total to date, 1937	**621,366**
Total to date, 1938	**371,597**

Includes awards of 100 tons or more.

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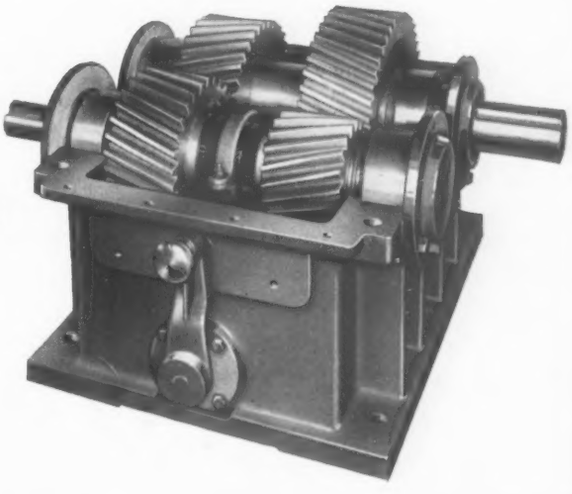

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Hahnmann hospital to same fabricator is outstanding. New inquiry is light.

Buffalo—Although none too active, the structural market is the brightest spot in the industry. New projects, calling for moderate tonnage are appearing in fair volume. A new 1100-ton wire mill for the Wickwire Spencer Steel Co., Buffalo, is due to be let soon. Architects are also busy on a substantial addition to Canisius college here.

San Francisco—Only structural award of size went to Judson-Pacific Co. and involved 135 tons for three buildings at the navy yard, Mare Island, Calif. Bids open June 27 for Adams river and New Briar canal, Boulder Canyon project, specification 791, calling for 238 tons of sheet piling, 104 tons of shapes and 446 tons of reinforcing bars. Awards totaled 1246 tons and brought the year's aggregate to 47,800 tons, compared with 100,947 tons a year ago.

Seattle—Few large projects are in contemplation. Shops have no backlogs and prospects are not bright for third quarter. Washington state will receive tenders June 21 for road projects in Wahkiakum, King, Clallam and Spokane counties totaling 510 tons in addition to 4160 feet of sheet piling. Mason Construction & Engineering Co., Seattle, has the contract for a dam and fishways at Steilacoom for the Everett Pulp & Paper Co.

Montreal, Que.—Dominion Bridge Co. Ltd., Montreal, has obtained a contract for supplying and erecting the structural steel for a $2,700,000 bridge across the St. Lawrence river at Bout de l'Isle, near Montreal. The company has also secured contracts for the steel for a $2,000,000 packing plant and office in St. Boniface, Manitoba, and for steel girders for the International Nickel Co., at Sudbury, Ont.

Shape Contracts Placed

8800 tons, government printing office annex building 3, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; McLoskey & Co., Philadelphia, general contractor; bids May 27.

2425 tons, six truss and 15 beam bridges, Mojave river, Calif. Union Pacific railroad, to American Bridge Co., Pittsburgh.

1930 tons, spillway gates, Chickamauga dam, Tennessee Valley Authority, to Dravo Corp., Pittsburgh, specification 94228; bid May 24.

1500 tons, 240 transmission towers, Scottsboro, Ala., Tennessee Valley Authority to American Bridge Co., Pittsburgh; specification 172077, part B; bid May 26.

1200 tons, structural steel framing for substructure and superstructure, Guntersville power house, Tennessee Valley Authority, Knoxville, Tenn., to Bethlehem Steel Co., Bethlehem, Pa., $76,960, f.o.b. Chicago; bids May 26, requisition 169629, awarded June 8.

880 tons, buildings, fair ground, Ebensburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

810 tons, 133 transmission towers, Trenton, Ga., Tennessee Valley Authority, to American Bridge Co., Pittsburgh, specification 172077, part A; bid May 26.

800 tons, Petroleum Industries building, world's fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.; listed in May 30 issue as reinforcing steel award.

780 tons, superstructure, Thirteenth street bridge, Savannah river, Richmond county, Georgia, to Bethlehem Steel Co., Bethlehem, Pa.; includes 140 tons of reinforcing steel pending; listed in May 30 issue as reinforcing steel award.

770 tons, sheet piling, breakwater development, Fairport, O., to Great Lakes Dredge & Dock Co., Cleveland.

550 tons, Hahnmann hospital, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, H-piles, pier No. 8, Main street bridge, Cleveland, to Carnegie-Illinois Steel Corp., Pittsburgh; through Lombardo Bros., Cleveland.

355 tons, building, Westinghouse Electric & Mfg. Co., world's fair, New York, to American Bridge Co., Pittsburgh; through United Engineers & Contractors Inc., Philadelphia.

280 tons, intake gates, Chickamauga dam, Tennessee Valley Authority, to Ingalls Iron Works, Birmingham, specification 94248; bids May 25.

250 tons, apartment, Bryn Mawr, Pa., to Max Corchin, Philadelphia.

235 tons, bridge, Madison county, Illinois, to Duffin Iron Co., Chicago.

230 tons, bridge, Goodman, Wis., to Bethlehem Steel Co., Chicago.

205 tons, 16 transmission towers, Knoxville, Tenn., Tennessee Valley Authority, to American Bridge Co., Pittsburgh; specification 173973.

185 tons, bridges FAP-FAS-34, Dallas and Denton counties, Texas, to Austin Bros., Dallas, Tex.

185 tons, state bridge FA-368, Osage, Iowa, to Bethlehem Steel Corp., Bethlehem, Pa.

175 tons, bridges FA-836 C and D, Lincoln county, Missouri, to St. Louis Structural Steel Co., St. Louis.

165 tons, junior fair building, Columbus, O., to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bridge FAP-362, Jefferson county, Wisconsin, to American Bridge Co., Pittsburgh.

160 tons, store alterations, B. Altman & Co., New York, to Post & McCord, New York.

150 tons, bridge FAP-715-F, Coryell, county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

150 tons, plant addition, Curtis-Wright Co., Buffalo, to R. C. Mahon Co., Detroit.

150 tons, church, Forest Hills, New York, to Lehigh Structural Steel Co., Allentown, Pa.; A. J. Naughton Bldg. Corp., general contractor, New York.

150 tons, state bridges, Manchester and Chester, Vt., to American Bridge Co., Pittsburgh.

145 tons, bridge project 6211, Tangiphoa parish, Louisiana, to Jones & Laughlin Steel Corp., Pittsburgh.

135 tons, three buildings, Mare Island navy yard, Calif., to Judson-Pacific Co., San Francisco.

130 tons, alterations to store building, S. S. Kresge Co., Detroit, to Palmer-Bee Co., Hamtramck, Mich.

120 tons, building, American Tobacco Co., world's fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, two bridges, Guntersville, Ala., Tennessee Valley Authority, to Nashville Bridge Co., Nashville, Tenn.; specification 173013.

115 tons, state bridges, Bagley and Henderson, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

105 tons, high school, Brownstown, Ind., to Bedford Foundry & Machine Co., Bedford, Ind.

100 tons, shapes and bars, high school addition, Branford, Conn., to Connecticut Steel Erecting Co., New Haven, and Topper & Griggs, Hartford; Eastern Construction Co., New Haven, general contractor.

100 tons, RCA building, world's fair, New York, to Lehigh Structural Steel Co., Allentown, Pa.; Ryan Construction Co., New York, general contractor.

100 tons, building, for Anthony Carlin

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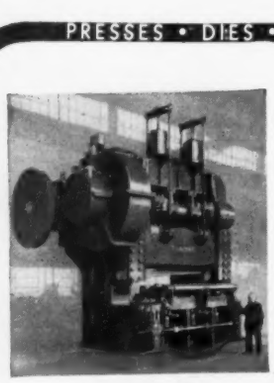

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Co., Cleveland, to Higley Albert Co., Cleveland.

Unstated tonnage, addition, Kerite Insulated Wire & Cable Co., Seymour, Conn., to Berlin Construction Co., Berlin, Conn.; H. Wales Lines Co., Meriden, Conn., general contractor.

Unstated tonnage, building 41, A. C. Lawrence Leather Co., Peabody, Mass., to West End Iron Works, Boston; E. H. Porter Construction Co., Peabody, general contractor.

Shape Contracts Pending

5400 tons, East and West approaches, Main street bridge, Cleveland; bids soon, also includes approximately 3550 tons of reinforcing bars.

2600 tons highway project and bridge, Cross Bay boulevard, Queens, N. Y.; bids June 21.

2480 tons, six Oklahoma highway bridges, including one at Bixby, requiring 1580 tons; bids taken June 21.

1250 tons, transit shed, Bayonne, N. J., Bethlehem Steel Co., Bethlehem, Pa., low, bids June 9 on steel work direct; contract also includes doors, siding, corrugated and other steel in superstructure, a miscellaneous volume not included in the 1250 tons above.

1200 tons, municipal water terminal, Bayonne, N. J.; bids asked.

1100 tons, mill building, Wickwire-Spencer Steel Co., Buffalo.

500 tons, school building, St. Benedict Joseph Labre parish, Morris Park, N. Y.

500 tons, coal tipple, Danville, Ill.

510 tons (also 4160 lineal feet sheet piling), Washington state highway projects; bids at Olympia, June 21.

400 tons, bridges, Washington and South Dakota, for Great Northern railway.

365 tons, I-beam bridges, Turnbridge and Castleton, Vt.; bids June 24.

350 tons, civic auditorium, Rochester, Minn.

300 tons, state bridge, contract 1692, state road 62, section M, Leavenworth, Ind.

285 tons, veterans' administration buildings, Dayton, O., United States treasury department.

270 tons, bridge No. 83.7, Nashville, Chattanooga & St. Louis railway, Resaca, Ga.

270 tons, veterans' administration building, Murfreesboro, Tenn.; N. P. Severin Co., Chicago, general contractor.

266 tons, railroad bridge, Paducah, Ky.

250 tons, bridges, Missouri and Kansas, for Missouri Pacific railroad.

250 tons, naphtha reforming heater and retaining plates, Sun Oil Co., Marcus Hook, Pa., and Toledo, O.

250 tons, highway bridge, Steuben county, New York; bids June 21.

200 tons, U. S. Government buildings, E, F, K and L, world's fair, New York; bids June 15.

200 tons, bathhouse, Brooklyn, N. Y.

188 tons, bridge, Coshocton count, Ohio; Wendling Bros., Dover, O., low.

175 tons, units for dam 43, West Point, Ky., for army engineers.

175 tons, state bridge, contract 1685, FAP-4, section A-3, Stilesville, Ind.

140 tons, administration building, Andrews school, Willoughby, O.; bids in.

135 tons, state bridge, contract 1620, FAP-628, section A, Maxville, Ind.

130 tons, head frames, Delaware aqueduct, Katonah, N. Y.

125 tons, underpass, Providence, R. I.

Unstated tonnage, Oregon state NR Thirty-third avenue overcrossing, Portland; Birkmeier & Saramel, Portland, low.

Unstated tonnage, reconstruction Pennsylvania avenue bridge, Anacostia river, Washington, steel girder structure consisting of nine spans of 154 feet each to carry 60-foot roadway; bids July 8, district commissioners.

Unstated tonnage, piling and structurals, improvement work on 12 United States coast guard stations scattered along shores of Lake Ontario and Lake Erie; project depends on outcome of three billion dollar spending bill now before congress.

Reinforcing

Reinforcing Bar Prices, Page 73

New York — Award of 1300 tons for a building for General Foods Corp., Hoboken, features reinforcing bar transactions. Most buying is for small tonnages with few outstanding inquiries pending, including 1500 tons for a Brooklyn sewer and 290 tons for a Lincoln tunnel approach, New Jersey. Although slightly less active, highway reinforcing contracts approximate 500 tons with close to 800 tons pending or to be bid. Prices on both bars and mesh are unsettled.

Boston — Highway mesh continues more active than bars, Connecticut closing this week on two road jobs, 240 tons. Arute Bros. Inc., New Britain, Conn., placed 165 tons, mostly mesh, with Truscon Steel Co., Youngstown, O., for a highway at Waterbury, Conn. Rhode Island closes June 20 on a small reinforcing project, Woonsocket, the first inquiry by that state in several weeks. Bar buying is in small lots with prices unsteady.

Cleveland—Requirements for reinforcing bars from private sources continue light, limited to a few miscellaneous tonnages. The outlook is more encouraging from public sources, with considerable tonnage for the Cloverleaf highway development near Brecksville, O., scheduled for bids soon and substantial tonnage for the Main street bridge, Cleveland, still pending. Republic Structural Iron Works, Cleveland, recently booked 235 tons for the nine land piers for the Main

Concrete Bars Compared

	Tons
Week ended June 11	4,990
Week ended June 4	1,705
Week ended May 28	5,609
This week, 1937	10,403
Weekly average, year, 1937	6,266
Weekly average, 1938	5,498*
Weekly average, May	5,872
Total to date, 1937	124,802
Total to date, 1938	131,955*

Includes awards of 100 tons or more.
*Revised.

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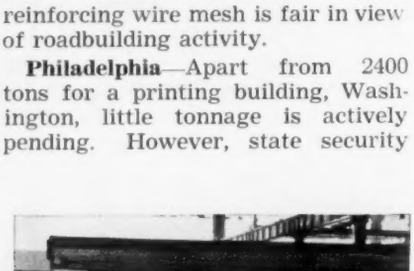
street bridge. Fabricated prices have weakened further.

Chicago — Demand for reinforcing bars continues light and bookings are in small tonnages. It is not believed the recent reduction in price by midwestern mills will have an appreciable stabilizing effect on the market. Demand for concrete reinforcing wire mesh is fair in view of roadbuilding activity.

Philadelphia—Apart from 2400 tons for a printing building, Washington, little tonnage is actively pending. However, state security prison, Mt. Gretna, Pa., requiring 2200 tons, and state training school, Whitehill, Pa., 1600 tons, may be revived shortly.

San Francisco—Again the reinforcing bar market leads with 2568 tons placed, bringing the aggregate for the year to 44,092 tons, compared with 39,959 tons last year. Among projects booked were 756 tons for a female ward at the state hospital, Napa, Calif., placed with Soule Steel Co., San Francisco. Bids have been taken on two alternates, one to be furnished by the general contractor and the other by the producer, for 1669 tons for the Indian irrigation service, Los Angeles. Interest is centered around the outcome of the award for the Shasta dam in California calling for 13,000 tons of reinforcing bars, 5000 tons of plates for penstocks and over 10,000 tons of shapes. All material is to be furnished by the bureau of reclamation. Pacific Constructors Inc., Los Angeles, submitted the low bid at $35,939,450.

Seattle—Demand continues slow, confined mostly to road projects and public works. Mill operations are restricted. Industrial construction is lacking and prospects are not encouraging. Tonnages pending do not exceed 2000 tons, and include 460 tons for Washington highway jobs.



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Reinforcing Steel Awards

1300 tons, building, General Goods Corp., Hoboken, N. J., to Concrete Steel Co., New York; H. K. Ferguson Co., Cleveland, general contractor.

756 tons, female custodinal ward, state hospital, Napa, Calif., to Soule Steel Co., San Francisco.

600 tons, buildings and power house, Armstrong Tire & Rubber Co., Natchez, Miss., to Connors Steel Co., Birmingham; B. L. Knost, Pass Christian, Miss., general contractor; structural steel still pending.

270 tons, new wire mill, Wickwire Spencer Steel Co., Buffalo; bids in.

260 tons, buildings, Johns-Manville Corp., Jarrett, Va., to Rosslyn Steel & Cement Co., Washington; Consolidated Engineering Co., Baltimore, general contractor.

235 tons, 9 land piers, Main street bridge, Cleveland, to Republic Structural Iron Works, Cleveland; through A. J. Forschner Co., Chicago.

200 tons, bureau of reclamation, invitation A-22,348-A, Parco, Wyo., to Colorado Fuel & Iron Co., Pueblo, Colo.

189 tons, cottages, Sonoma state hospital, Calif., to Soule Steel Co., San Francisco.

160 tons, mostly mesh, 8710-foot section reinforced concrete, South Main street, Waterbury, Conn., to Truscon Steel Co., Youngstown, O.; Arute Bros. Inc., New Britain, Conn., general contractor.

160 tons, waterworks and elevated tanks, Keokuk, Iowa, to Sheffield Steel Co., Kansas City, Mo.

150 tons, underpass, South Laramie avenue, Chicago, to Calumet Steel Co., Chicago.

133 tons, bureau of reclamation, invitation 27,578-A, Charleston, Utah, to Republic Steel Corp., Cleveland.

132 tons, bureau of reclamation, Denver, to Republic Steel Corp., Cleveland, at $7602.50 f.o.b. Charleston, Utah; Steel Corp., Kansas City, Mo.

125 tons, Scaife residence, Laughlintown, Pa., to Jones & Laughlin Steel Corp., Pittsburgh, through Dambach Inc.

120 tons, bridge, route 90, section 1-D, Marshall county, Illinois, to Bethlehem Steel Corp., Bethlehem, Pa.

100 tons, power house, state prison, Jefferson county, Missouri, to Sheffield Mich., to Pollak Steel Co., Cincinnati.

100 tons, Traverse hospital, Petoskey, bids May 24, schedule 27518-A.

Reinforcing Steel Pending

1500 tons, sewer, Avenue T and Flatbush avenue, Brooklyn; Luang Construction Co., Brooklyn, low; bids June 8.

1500 tons, Cross Bay boulevard project, Queens, N. Y.; bids June 21, also includes 300 tons steel sheet piling.

625 tons, merchandising buildings, Chicago.

550 tons, Four Square building, Minnesota state fair, Minneapolis.

800 tons, water mains and reservoir, Grand Rapids, Mich.; previous bids rejected.

290 tons, approach, Lincoln tunnel, North Bergen, N. J.; I. B. Miller Co., New York, low; bids June 7.

285 tons, mesh and bars, Needle Trades school, New York.

275 tons, concrete tank, Beacon Oil Co., Everett, Mass.

250 tons, dam, Pittsburgh, N. H.

225 tons, Baranoff hotel, Juneau, Alaska; A. W. Quist, Seattle, general contractor.

200 tons, Washington state highway projects; bids at Olympia, June 21.

200 tons, stage terminal, Portland, Oreg.; L. H. Hoffman, Portland, Oreg., general contractor.

185 tons, highway, Auburn, Me.

135 tons, Emmett, Idaho, reclamation project; bids in at Boise.

130 tons, sewage disposal plant, Wooster, O.; bids June 14.

128 tons, Lincoln tunnel approach, Weehawken, N. J., contract MHT-28; bids July 6, Port of New York authority.

100 tons, power house, Link Belt Co., Indianapolis.

100 tons, building, Carboloy Co., Detroit.

Unstated tonnage, Oregon state bridge projects in Klamath, Clatsop and Tillamook counties; bids in at Portland.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh — Pig iron shipments continue to move from furnaces to consumers at about the same rate as in the past several weeks. Shipments are confined largely to No. 2 foundry and malleable irons, with a scattering of basic, but individual lots are small. Consumers appear satisfied with reaffirmed pig iron schedules for third quarter, but are not buying ahead. Blast furnaces in operation total 14, unchanged from last week, which is around 24 per cent of capacity.

Cleveland — Foundry operations continue comparatively steady at two or three days a week. Reflecting this condition buying is on a hand to mouth basis. Present estimates for June is that shipments

from producers' stocks should recede approximately 10 per cent from the May level. Opening of books for third quarter has not brought in additional tonnage. Stocks are not excessive despite the the low volume of shipments over the last 60 days. Prices are firm.

Chicago — Pig iron is moving slower and restricted foundry schedules have curtailed many releases on earlier commitments. The weakness of demand is expected to continue and a general decline be in evidence throughout the summer. Curtailment of output by local mills is contemplated.

Boston — Pig iron buying has settled down to small lots for fill-in requirements. There is no change in foundry melt which for most industries is not better than 20 per cent. Exceptions are the district cast pipe foundry, operating four days a week, and a valve shop in the Springfield district. The latter is taking steady shipments against previous purchases for delivery through the quarter. Steelworks, with operations on the down grade, are not buying and still have substantial stocks. This is also true of larger foundry consumers, based on current operations, although a moderate upturn in demand for castings would materially change the situation.

New York — Carlot orders for prompt delivery still comprise most current pig iron buying. The larger consumers, who have fair stocks on hand from last year, continue out of the market, with a result that only the smaller buyers, who have no stocks, show interest and then only for immediate needs. Export buying is negligible, with inquiries small and principally for special analyses.

Philadelphia—Pig iron activity is limited with individual orders small. Little improvement is indicated for the next several weeks.

Buffalo — Although pig iron shipments are desultory, producers generally are not expecting any pronounced expansion in orders until fall. Melting is low. Malleable foundries have curtailed operations due to almost complete lapse in releases from automotive sources.

Cincinnati — Pig iron market continues depressed, the only activity being occasional spot shipments. Quotations have been reaffirmed for third quarter but this aroused no interest in future covering. Because of light foundry schedules, with few exceptions, and hazy outlook for the summer, shipments tend moderately slower than in May.

St. Louis—Buying of pig iron has receded further, even the small, prompt activities of recent weeks having dwindled to insignificant proportions. Shipments, however, are holding up fairly well, total tonnage so far this month being about equal to that of the comparable period in May, but somewhat below April. Aggregate May shipments were the smallest for the month since 1932. The melt holds steady, buttressed by increased production at stove plants. In the Quincy and Belleville, Ill., sections operations range from 3 to 5 days per week, work being on stoves for August and September shipment.

Birmingham, Ala.—With confirmation of prices some improvement is anticipated. A slight upturn in production is noted for the week with blowing in of Republic's Thomas furnace to bring the district's total to seven active stacks.

Toronto, Ont. — Demand for merchant pig iron is steady but no large tonnage business is reported. Sales reached a total of better than 2000 tons with spot orders ranging up to 500 tons. Inquiries are increasing and local blast furnace representatives look for heavier shipments during the next three months. Books for third quarter delivery will open within the next two weeks.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Bolt and nut specifications so far this month have exceeded those of the corresponding period in May. While specifications have been diversified, they nevertheless have been bolstered principally by railroad releases for miscellaneous repairs and by a gain in shipbuilding requirements. June may see substantial ship yard releases, it is said, with requirements of certain of the Standard Oil boats, placed around the beginning of this year, likely to be awarded soon. Bolt, nut and rivet requirements of the four C-2 cargo boats awarded by the United States maritime commission to the Newport News Shipbuilding & Dry Dock Co., will be supplied by the shipyard itself. Export demand is featured by expanding shipments to Manila, presumably for ultimate shipment to either China or Japan or to both countries.

Scrap

Scrap Prices, Page 76

New York—A group of American brokers sold 370,000 tons of heavy melting steel scrap to the European cartel for delivery over the next four months at $10 f.a.s. ports for No. 1 and $8.50 for No. 2. This is $5 a ton lower than that paid by Italy for 80,000 tons late last fall and compares with $16.50 paid for several hundred thousand tons by the cartel in its last bulk purchase. Forty per cent of the order is to be No. 1 and the balance No. 2 with shippers allowed to substitute compressed bundles against the latter grade. Not all the brokers who shared in the last cartel volume are involved. Brokers are now paying

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$8.50, barge for No. 1 and $7.00 for No. 2, although one interest is bidding $1 higher for No. 1. Shippers are now actively covering against this volume and some material has been accumulated to apply against immediate shipments. Domestic demand for all grades of scrap is sluggish, only a few cars moving from time to time at unchanged, but low prices. Rails for rolling have been lowered 50 cents a ton.

Pittsburgh—With shipments of iron and steel scrap still restricted by consumers, small lots make up most current business. Further price recessions have appeared, with bloom crops and low phos forging crops each dropping 50 cents, railroad heavy steel down 25 cents, as also are machine shop turnings. The small portion of the Baltimore & Ohio offerings on heavy steel that brought $12.50 is said to have gone largely to consumers farther down the Ohio valley.

Cleveland—Two grades of iron and steel scrap appear to be holding their own in an otherwise weak and retreating market, cast iron scrap and casting borings, including No. 2 busheling. Gray iron foundries seem to be continuing use of a proportionately larger percentage of cast scrap.

Practically all the other heavier grades have declined. Scrap trading appears to have become almost a matter of individual dicker, with the natural result that most quotations are purely nominal.

Chicago—This remains the most quiet of all markets and is practically dormant while prices continue to sag. One mill has been reported seeking a small tonnage of heavy melting steel at $10 but no sale has been known. The range of heavy melting steel is nominal at $9.75 to $10.25. Should a purchase be made at $10, this will be the first definite gage of price since an $11 sale over a month ago.

Boston — Iron and steel scrap continues dull, buying by New England consumers being light with shipments to Pennsylvania at a low point. In addition to lowering bids for heavy melting steel, brokers have reduced stove plate and No. 2 cast for export, paying $5, dock, for the former and $7 for cast. Recent purchase of 370,000 tons of heavy melting steel by the European cartel at $10 f.a.s., Atlantic ports, for No. 1 and $8.50 for No. 2, while likely to stimulate activity, would indicate that prices on these grades are not likely to develop much additional strength unless given unexpected support by the domestic market.

Philadelphia—With steel scrap prices holding at $11.50 to $12, delivered consuming point, little scrap will leave this district for shipment against the recent heavy purchases in this country for European delivery. Reliable estimates place the tonnage at about 350,000 tons with about 40 per cent No. 1 steel and the remainder No. 2. Germany is reported to have taken the slightly greater part, with deliveries to start within two weeks and continue for three months. Five sellers are said to have taken this business.

Grate bars and stove plate are higher at $10.50 to $11 and heavy cast grades are strong but unchanged. Chemical borings are off $9.50 to $10.50.

Buffalo—Dealers in iron and steel scrap are still reluctant to sell at the bid price of $10.50 a ton for No. 1 heavy melting steel. Sellers are confining activity to filling orders placed at higher levels.

Dealers claim it would be difficult to replace scrap sold at prevailing bids, as the price offers little incentive for scrap to come out. With the supply diminishing some believe that the price recession may be nearing the end.

Detroit — Despite widespread pessimism, some can see a few rays of hope in scattered reports of improved activity among small plants, although the scrap market reflects additional weakness. No important lists have been up this week and those next offered probably will be smaller.

Cincinnati—The iron and steel scrap market shows no improvement. Prices are weak and unchanged pending reports from bidding on railroad lists. Steelmaking schedules for June will likely be off compared to May and so far scrap inventories of mills have been adequate.

St. Louis—The downward trend in prices of scrap iron and steel continues in a typically dull summer market. Aside from operations of dealers, who are taking heavy melting steel to apply on contracts, purchasing is virtually at a standstill, and no revival is expected for six weeks or two months.

Offerings by country dealers are freer than for many months, due mainly to desire to convert accumulations into cash.

Birmingham, Ala.—Scrap continues weak. Some tonnage in cast grades is being absorbed by foundries and prices are wavering downward.

Seattle—The market is marking time, with the Orient placing no business and local mills having ample stocks. Japan has not indicated what tonnages will be imported during third quarter. Tidewater stocks generally are low as conditions are not conducive to shipments from the country. In the absence of actual sales, prices are hard to establish but the situation as a whole is weak.

Toronto, Ont.—Trading in iron and steel scrap shows some improvement but demand continues specialized. Heavy melting steel maintains good demand and local dealers are making shipments to the Hamilton mills when supplies are available. Foundries are in the market

for cast scrap and stove plate and find difficulty in obtaining sufficient supply. Automobile scrap is held in large quantities around Toronto. Offerings from rural districts have increased although they are well under the average in previous years. Dealers have made no revision in prices.

Warehouse

Warehouse Prices, Page 75

New York—With few exceptions, warehouses report volume slightly under that of May average, the decline being evenly distributed as to products. Specialty lines appear to be lagging slightly behind the more standard steels, although stainless is an exception with some jobbers.

Cleveland—Sales and shipments out of warehouse stock are generally unchanged from the comparable period during May. However, in a few instances a slight improvement is reported in tonnage shipped recently. Individual requirements are limited to actual needs, but the number of orders has shown a slight gain. Distributors are waiting for mills to announce third quarter prices on galvanized sheets before they will adjust prices.

Chicago—Sales have leveled off and there is no sign of an appreciable decline. Heavier lines are moving more slowly and sales of the lighter commodities are slightly more active.

Philadelphia — Warehouse tonnage is down from a month ago. Prices are unchanged pending action on galvanized sheets.

Buffalo — Warehouse sales are maintaining the average level of the last two months. Flat-rolled products generally are in best demand. Readjustment in prices is expected as soon as mills make definite announcements.

Detroit — Some improvement in warehouse trade is expected as plant rearrangements in preparation for new models get under way, Dodge already having started the ball rolling with work on a new spray booth setup for a changeover in plant methods.

Otherwise business is moving at a low level. Die shops report they expect an influx of work after July 15 when new model activity approaches its peak.

St. Louis—Final reports of warehousemen indicate May sales slightly below the preceding month, and approximately one-fourth smaller than in May, 1937. In both comparisons, losses are spread over practically all items, but are most marked in building material and railroad supplies. Manufacturers' demand for sheets has receded further, including light galvanized material.

Cincinnati—Improvement in ordering from warehouses failed to hold and sales have reverted to a level comparable to that during May. Seasonal demand from coal mining interests is disappointing. Industrial orders are fairly well maintained numerically but light in volume.

Seattle — Out of stock volume is spotty, mill buying occasional. No item is in outstanding demand. Volume is far below levels of a year ago and prospects for third quarter presage no improvement. Price lists are unchanged although there may be some adjustment in sheets about July 1.

Iron Ore

Iron Ore Prices, Page 76

New York — With fairly large stocks on hand, consumers of foreign ore show little interest in new tonnage, and sellers, appreciating this situation, are making little effort to attract business by offering concessions. This is particularly true of iron, manganese and chrome ores.

Supporting this relatively firm position of sellers is the fact that demand on the other side, while now sagging, is still reasonably active. Only a few price changes are noted and these are nominal. Chilean manganese ore, 46 to 48 per cent, is now being offered at 38c to 40c, per unit, without duty, and some revisions are also noted in Indian chrome ore.

Cleveland—American lake ore carriers in commission June 6 numbered 123, or 39.9 per cent of the fleet of 308, according to M. A. Hanna Co., Cleveland. This compares with 312, the entire fleet, on June 15 last year. The number of carriers engaged in the ore trade June 6 was 87.

Steel in Europe

Foreign Steel Prices, Page 75

London—(*By Cable*)—Slight improvement in demand for steel in Great Britain was noted immediately before Whitsuntide, particularly owing to shipbuilding orders placed. Scottish shipyards had a quiet week, because of the Whitsuntide interval. It is reported existing semifinished steel stocks may be sufficient to last until the end of third quarter.

The Continent reports renewal of the European steel cartel is imminent, the Belgian group being reported to have solved its differences. In general business is quiet and prices are weak.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh—Tin plate mill activities in this district now average around 32 per cent, with some mills active up to 45 per cent and others at considerably less. Normally this

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should be a busy season for tin plate makers, but due to the large western carryover of fruit and salmon pack, the tin plate trade is only of fair volume.

New York. — Considering the season, tin plate demand continues disappointing to sellers. Normally specifications are expanding rapidly at this time for the canning of food products, but this year there has been little increase for several weeks. Not only does there appear to be a fair stock of containers on hand, but it now seems likely that there will be less actual canning. Export demand remains light with foreign producers participating more actively in the world markets and tin plate stocks generally much larger than a year ago.

Finds Competition in Farm Tool Manufacture

(*Concluded from Page* 18)

Harvester fell to not quite 12 per cent, and that of other important combine manufacturers also decreased sharply.

"In certain manufacturing companies a few stockholders have large voting control, especially in some of the smaller companies, where stock is closely held. Among the larger companies, nine stockholders controlled 37.9 per cent of the voting stock of International Harvester Co., and 14 stockholders controlled 49.1 per cent of the voting stock of Deere & Co. The report does not indicate close relationship among the larger companies through common ownership of stock or interlocking directors or officers."

As to pricing practices the report says: "For most implements and machines International Harvester Co. and Deere & Co. generally are regarded by other manufacturers as 'price leaders' of the industry. Announcement of prices by other manufacturers is delayed until the prices of these leaders are published. . .

"The practice of following the leaders in pricing activities, such as extensive exchanges of prices and specifications, and standardization of design and construction of implements, have been substituted for the older, cruder and more obviously illegal agreements by which manufacturers sought co-operatively to control or restrict competition and enhance prices prior to 1920, as shown in the commission's 1920 report on 'Causes of high prices of farm implements.'"

The report cites as a striking illustration of the primary importance of farm income in relation to the farm implement and machinery industry, the fact that when farm income available for operators' labor, capital and management expenditures decreased from approximately 5.7 billion dollars in 1929 to 1.5 billions in 1932 the value of farm implement production decreased from approximately $607,000,000 to an estimated $95,000,000.

On the other hand improvement of farm income, particularly in 1936 and 1937 resulted in making 1937 the most prosperous year for farm machinery manufacturers since the World war.

Metallurgical Coke

Coke Prices, Page 73

Foundries are placing more orders for Connellsville beehive coke and extending short term contracts for this fuel just as they are doing with their pig iron purchases in western Pennsylvania and eastern Ohio. Demand is more insistent for prompt or quick delivery coke. All of this is strengthening both the foundry fuel price to $4.75 to $5.50 and furnace coke to flat $3.75.

Activities of Steel Users, Makers

■ COMPLETE stock of high nickel content alloys in various shapes and sizes, particularly Nichrome and Nichrome V is now available to the Pacific coast trade, according to an announcement of the Driver-Harris Co., Harrison, N. J. The warehouse is located at 316 Eleventh street, San Francisco, and the Pacific coast representative is the Electrical Specialty Co. Ltd. Nichrome stocks will also be maintained in Los Angeles and Seattle.

♦

California Wire Cloth Co., Oakland, Calif., will be taken over by Colorado Fuel & Iron Corp. July 1.

♦

American Dirigold Corp., Kokomo, Ind., has changed its firm name to American Art Alloys Inc.

♦

Safety Mining Co., 307 North Michigan avenue, Chicago, has changed its firm name to Cardox Corp.

♦

Gem City Elevator Works Inc., Dayton, O., has moved its office and factory from 612 Washington street to 15 Keowee street.

♦

Mercoid Corp., Chicago, has moved its New York office from 90 West street to 330 West Thirty-fourth street.

♦

Triplex Machine Tool Corp., 125 Barclay street, New York, has been appointed agent for the Maag Gear-Wheel Co. Ltd., Zurich, Switzerland, maker of gear grinding machines.

♦

International Nickel Co. Inc., New York, has opened a branch office in

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

Pittsburgh, under the management of H. V. Beasley, formerly of the New York office.

♦

General Controls Inc., maker of automatic temperature controls, has moved its entire factory from San Francisco to a new plant recently completed in Glendale, Calif.

♦

Los Angeles headquarters of Fray-Mershon Inc., manufacturer of precision machinery and bench tools, have been transferred to the new factory at 515 West Windsor road, Glendale, Calif., where E. M. Rahm is in charge of production.

♦

Stearns Magnetic Co., Milwaukee, maker of magnetic separators and magnetic friction devices, appointed the Delavan Engineering Co. as its sales representative in Des Moines, Iowa.

♦

Dietzel Lead Burning Co., Pittsburgh, recently purchased a building with one-half acre of ground for shop purposes at Coraopolis, Pa. The company expects to occupy the new plant about June 15.

♦

Sheffler-Gross Co., Philadelphia, has appointed the Specialty Products Co., Boston, as exclusive distributor in the New England territory for its Duoflo suction and discharge strainers.

♦

Oliver H. Van Horn Co. Inc., New Orleans, with branches at Houston, Tex., Shreveport and Baton Rouge, La., has added the complete line of Stanley Electric tools to its stock of supplies and equipment for the industrial and automotive trade.

♦

United States department of the interior, Denver, has awarded Western Gas division, Koppers Co., Fort Wayne, Ind., a contract for 36 24-inch cast steel gate valves to be installed in the Grand Coulee dam, state of Washington. Eighteen are to be chain operated and 18 motor operated.

♦

Acme Electric Welder Co., Huntington Park, Calif., has appointed the following distributors: Welding Engineering Sales Corp., New York, Buffalo and Syracuse; Robert W. Hoffman Co., Chicago; Joseph N. Moyer, Philadelphia; Victor Equipment Co., San Francisco, and Meyer Machinery Co., Los Angeles.

♦

Merritt-Chapman & Scott Corp., New York, has installed an 800-foot railroad track to carry the 200,000 tons of riprap required for the $600,000 Presque Isle breakwater, Marquette, Mich. The company is general contractor for the breakwater, part of the Great Lakes waterway project.

♦

Austin Co., national organization of industrial engineers and builders, has established a new office in the Second National Bank building, Houston, Tex. G. M. Hunting, veteran member of the company and its district engineer in Texas from 1928 to 1932, is resident manager of engineering and construction operations in that district. Donald G. Austin is resident sales manager.

♦

Bode-Finn Equipment Co. Inc., Cincinnati, has been appointed distributor in southern Ohio by Bucyrus-Erie Co., South Milwaukee, Wis. Bucyrus-Erie shovels, draglines, clamshells and lifting cranes, ranging from ⅜ to 2-yard sizes, will be sold by the Bode company, which will work in co-operation with the Bucyrus-Erie branch office in Pittsburgh.

♦

American Concrete & Steel Pipe Co., South Gate, Calif., has named the Hume Pipe Co. of New England Inc., Swampscott, Mass., a distributor of Amercoat products. Other distributors appointed by the company are: Gregg Co., Philadelphia; American Hume Pipe Co., Detroit, and Constructor Specialties Co., St. Louis.

Canadian Foreign Steel Trade Less in April

Canada's steel imports for April showed a decline from the same month last year, at a total value of $14,173,000, compared with $15,917,000. Value of imports from the United States dropped from $13,925,000 to $11,543,000. Machinery led the list, with value of $2,295,000, compared with $3,291,000 for April, 1937.

Other imports from the United States included farm implements, $2,037,000; automobile parts, $1,914,000; automobiles, $1,899,000; plates and sheets, $613,000; rolling mill products, (general), $469,000; engines and boilers, $454,000; tubes and pipes, $168,000; castings and forgings, $136,000; tools, $108,000.

Exports were also lower, at $4,017,000, against $4,884,000 for April of last year. Exports to the United States declined from $585,000 to $383,000.

Reader Comments

(*Concluded from Page 9*)

tration is being thrown into an effort to have prices of steel reduced, arguing that when demand is light business should be stimulated by lower prices, even with the result of direct losses. Does it require much imagination to foresee at least an effort to regulate steel prices, as railroad rates are controlled by a government commission?

To the proposition that wages must be lowered if the price of steel is reduced the administration makes the same resistance that is seen in the proposal of railroads to reduce wages in order to save themselves from being wiped out as independent, self-operated entities.

I think the statement of E. T. Weir of National Steel Corp. last week before the American Iron and Steel institute puts the case of the steel industry admirably as to its fair pricing methods and the obstacles that prevent lower prices. The situation facing the industry

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demands every effort to prevent the nutcracker being applied as it has been in the case of the railroads, which would spell ruin to one of the largest producing industries of the country, to the loss of practically every person in the nation.

STEELMAKER

Pittsburgh

Imports Are Light

Philadelphia—A shipment of 8818 tons of manganese ore was received here in the week ended June 4. No iron or steel shipments were received.

Baltimore — Ore shipments are fairly sustained. During the period from May 18 to May 27, inclusive, three shipments of iron ore arrived here, comprising 11,500 tons from Cruz Grande, May 24; 11,850 tons, from the same port, May 26; and 8023 tons from Narvik, Sweden, May 26.

A shipment of 4706 tons of chrome ore was received from Lourenco Marquis, Portuguese East Africa, May 19; 2000 tons of manganese ore from San Diego, Cuba, May 18; and 8200 tons from San Diego, Cuba, May 25.

Two hundred tons of pig iron came in from Bergen, Norway, May 19; 502 tons pig iron from Rotterdam, May 27; and 200 tons of ferromanganese from Skiensfjordon, May 19.

Nonferrous Metals

New York — Price sentiment in nonferrous metals stiffened last week due to ever widening curtailment of production. Demand maintained a good pace in lead and showed improvement in copper late in the week. Domestic prices held steady.

Copper—Kennecott Copper Corp. will close all domestic properties for at least one month, starting around June 16. This is the most drastic action taken since 1922. Prospects of a stronger statistical position resulted in higher prices abroad with export advancing to around 8.75c, c.i.f. Japan re-entered the market for substantial tonnages. Consumers here covered a larger portion of their requirements as the foreign market approached the domestic level which held at 9.00c, Connecticut, for electrolytic.

Lead — Sales at the 4-cent level have been larger than at the previous 4.25 and 4.50-cent levels. Consumers apparently believe that present levels are "reasonable" and possibly "cheap" and have actual need for additional supplies. Paid-up refinery stocks have declined steadily.

Zinc — Return of support to 4-cent zinc has been gradual but sufficiently strong to hold the market through a period of stock accumulation. Galvanized sheet output is holding at around 39 per cent of capacity.

Tin — Prices advanced to the highest levels attained in two months on Friday but demand remained quiet. Strength was attributed to the reduction in quotas to 45 per cent for the third quarter and to the approval of the buffer pool plan. The market continued sensitive to fluctuations in Wall street security prices. Straits spot closed at 39.37½c.

Antimony — Demand remained rather slow although buying gained slightly on Thursday when Chinese spot declined ¾-cent to the nominal level of 14.00c, duty paid New York. American spot in cases held unchanged on the basis of 11.75c, New York.

Equipment

Cleveland — Continued dullness through the summer months is anticipated by machine tool and equipment dealers, who expect a pickup in the fall, probably around mid-September. A few tools are being bought by various industries. These mostly were figured several months ago. Government orders offer some encouragement to builders, while foreign business continues an important factor.

The Cleveland diesel engine division of General Motors was low bidder for 15 diesel engines for navy submarines at $2,625,000. Signing of the contract, expected this week, will assure the plant's full-time operation for at least a year.

Seattle—Seasonal activity is receding and generally business is slow. Mining industry has placed its orders for the summer while cannery and lumber activity is below normal. Road equipment and electrical and pumping supplies are in best demand. Link Belt Co., San Francisco, is low at $22,432 for furnishing a conveyor system for the University of Washington, Seattle, boiler and heating plant improvement.

Chicago—Sales of machinery and equipment are only in small volume and unchanged from the slow rate of recent weeks. Machine tool orders for railroad shops are still pending while ordering of heavier equipment by the carriers is seemingly more remote than before. A leveling off in sales is expected to prevail at least until midsummer.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

June	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot. N.Y.	Nickel Cathodes
4	9.00	9.12½	8.52½	38.50	38.60	4.00	3.85	4.00	20.00	11.75	35.00
6	9.00	9.12½	8.52½	38.50	36.65	4.00	3.85	4.00	20.00	11.75	35.00
7	9.00	9.12½	8.52½	38.75	38.95	4.00	3.85	4.00	20.00	11.75	35.00
8	9.00	9.12½	8.52½	38.50	38.70	4.00	3.85	4.00	20.00	11.75	35.00
9	9.00	9.12½	8.52½	38.70	38.90	4.00	3.85	4.00	20.00	11.75	35.00
10	9.00	9.12½	8.52½	39.37½	39.50	4.00	3.85	4.00	20.00	11.75	35.00

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Cleveland, No. 1 ..... 6.00-6.25
*Chicago, No. 1 ..... 6.25-6.50
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Cleveland 4.50-4.75
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*St. Louis 3.75-4.00

Light Brass

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*St. Louis 2.25-2.50

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Cleveland 2.75-3.00
Chicago 2.75-3.00
*St. Louis 2.50-2.75

Zinc

New York 1.75-1.87½
Cleveland 1.50-1.75
St. Louis 1.50-1.75

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Massachusetts

BOSTON—Bureau of yards and docks, navy department, Washington, plans installation of electric power equipment in new addition to structural shop at Boston navy yard, for which appropriation of $731,500 has been authorized.

BOSTON — Boston Dry Dock Co. Inc., recently formed, has purchased former shipyard of Richard T. Green Co., near East Boston, and will remodel for new shipbuilding and repair plant. Work will include new one-story shop and construction buildings, marine railway, new piers and other facilities. G. Hobart Stebbins, formerly associated with Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass., heads the new company.

CAMBRIDGE, MASS.—J. L. Hammett Co., 209 Main street, plans installation of power equipment in new four-story building, 105 x 180 feet, for storage, distribution and other service. Material handling equipment will be installed. Cost estimated at $150,000.

WESTON, MASS.—Power plant of the Massachusetts Broken Stone Co. was recently damaged by fire. Considerable machinery was damaged.

New York

NEW YORK—General Foods Corp., 205 Park avenue, will install motors and controls, regulators, conveyors, electric hoists and loaders and other equipment in connection with an expansion and improvement program at its various plants. Total expenditure estimated at $7,000,000. Project will include erection of several new plants.

OGDENSBURG, N. Y.—City plans constructing municipal power plant, costing about $700,000. Application for federal funds will be filed.

RENSSELAER, N. Y.—General Aniline Works Inc. has awarded general contract to William O. Sheehan Construction Co. Inc., Albany, N. Y., for erection of one-story reinforced concrete warehouse at its plant here, to cost more than $50,000 with equipment.

ROCHESTER, N. Y. — Bausch & Lomb Optical Co., 635 St. Paul street, maker of scientific instruments and parts, plans one-story addition, costing close to $50,000 with equipment.

Connecticut

DERBY, CONN.—Derby Gas & Electric Co., M. Eckhardt, president, 22 Elizabeth street, is making alterations and improvements to its power plant, including new boiler and turbine. Cost about $80,000.

Pennsylvania

FLEMINGTON, PA.—Foran Foundry, which recently sustained damage by fire, plans to start reconstruction work immediately.

READING, PA.—City plans constructing electric generating plant to supply current for city pumping plants and municipal buildings. Burns & McDonnell Engineering Co., 307 East Fourth street, Cincinnati, engineer.

Ohio

BELLEVUE, O.—Gypsum Canning Co., A. C. Domrose, superintendent, plans rebuilding canning factory.

CANTON, O.—Ohio Power Co., Newark, O., has plans nearing completion for new power substation here. Work scheduled to begin soon.

CINCINNATI—Cincinnati Auto Spring Co., 218 West Pearl street, has awarded general contract to Anderson & Holz, 3287 Erie avenue, for erection of one-story plant, 90 x 120 feet. Cost over $40,000 with equipment.

CLEVELAND — Independent Register Co., 3747 East Ninety-third street, maker of heating and ventilating registers, has let general contract to Albert M. Higley Co., 2036 East Twenty-second street, for erecting one-story addition, 110 x 140 feet. Estimated cost $75,000 with equipment.

NEWARK, O.—City, Fred L. Simross, service director will take bids due noon, June 17, for new steam driven turbine centrifugal pump and auxiliaries.

Michigan

KALAMAZOO, MICH.—City purchasing agent will take bids until June 27 for improvements to municipal power plant, including extension of the present plant, installation of new equipment, a traveling screen and a 25-ton crane.

Illinois

ROXANA, ILL.—Shell Petroleum Corp., Shell building, St. Louis, will install power equipment, tanks and other mechanical equipment in connection with rebuilding of oil refinery plant here recently destroyed by fire. (Noted May 16.)

SPRINGFIELD, ILL. — Illinois state highway department will soon take bids on general contract for one-story equipment and shop building, 195 x 600 feet, at Dixon, Ill., including forge shop and other mechanical divisions, with storage and distributing facilities.

Indiana

CULVER, IND. — Culver Educational Foundation, Col. C. C. Chambers, secretary, plans extensions and improvements in power plant at local Culver Military academy, including installation of new electric generator unit and accessories; 625-horsepower watertube boiler, transformers, motors, pumps and complete auxiliary equipment.

FORT WAYNE, IND. — Acme Engineering Co. Inc., Old First National Bank building, has plans for hydroelectric power development on Salomie river in Huntington and Wabash counties, near Huntington, Ind., where sites have been purchased. Project will consist of three power dams and two hydroelectric generating stations, with transmission lines, power substation, switching station and other operating facilities. Bids for equipment will be asked late in summer. P. H. Clouser is head.

Maryland

ANNAPOLIS, MD.—Bureau of yards and docks, navy department, Washington, is asking bids for extensions and improvements in electrical system at naval academy. Specification 8722.

District of Columbia

WASHINGTON—Bureau of yards and docks, navy department, is securing fund of $500,000 through annual navy appropriation bill, recently approved, for new power plant and equipment in fourteenth naval district.

WASHINGTON—Office of the general purchasing officer, will open bids on schedule 3359 at 10:30 a. m., June 28, for motor generator set with switchgear and control equipment, transformers, power cable and all circuit breakers, for delivery to Canal Zone.

WASHINGTON — Bureau of supplies and accounts, navy department, will take bids until 10 a.m., on the following dates: June 17, schedule 3660, steel valves, delivery Brooklyn, N. Y.; schedule 3684, one motor driven horizontal bulldozer type hydraulic press, delivery Boston; schedule 3685 one motor driven nibbling machine, delivery Boston.

June 21, schedule 3622, dies, taps, diestocks, threading sets and tap wrenches; schedule 3637, composition valves; schedule 5678, chrome-molybdenum steel tubing; schedule 3681, one motor and controller boiler feed pump, delivery Portsmouth, N. H.; schedule 3682, one drilling machine, delivery Newport, R. I.; schedule 3689, 350.000 feet of flexible steel cable, delivery San Diego, Calif.; schedule 3712, aluminum alloy; sheets, angles, tubing and rivets, delivery Norfolk, Va.; schedule 3717, pneumatic, hand, portable sanding machines; schedule 3728, one motor driven radial drill, delivery San Pedro, Calif.; schedule 3729, two motor driven power hack saws, delivery San Pedro; schedule 3730, two floor type electric grinders, delivery San Pedro; schedule 3731, one motor driven precision bench lathe, delivery San Pedro; schedule 3732, motor driven grinding universal tool and cutter machines, delivery San Pedro and Puget Sound, Wash.; schedule 3733, motor driven floor type sensitive drills, delivery San Pedro and Puget Sound; schedule 3734, motor driven medium-heavy duty engine lathes, delivery San Pedro and Puget Sound; schedule 3735, motor driven engine lathes, delivery San Pedro and Puget Sound; schedule 3737, insulated electric cable, delivery Mare Island, Calif.; schedule 3738, generators, design data and drawings, delivery Anacostia, D. C.; schedule 3745, motor driven duplex milling machine and equipment, delivery Anacostia, D. C.; schedule 3746, vertical reciprocating pumps and spare parts, delivery Mare Island, Calif.; schedule 3747, combined auxiliary air and circulating pumps and spare parts.

June 24, schedule 3719, one motor driven automatic tool room machine, delivery Philadelphia; schedule 3720, one power driven press, delivery Philadelphia; schedule 3721, one motor driven cutter and radius grinding machine, delivery Philadelphia; schedule 3722, one motor driven press type forming brake, delivery Philadelphia; schedule 3725, turbine driven forced draft blowers, delivery Brooklyn, N. Y., and Philadelphia; schedule 3751 electric winches and spare parts; schedule 3752, steel, corrosion-resisting, plates and sheets, floor.

June 28; schedule 3748, nickel-copper-alloy forgings, delivery Washington, D. C.; schedule 3749, for 390 alloy steel forgings, delivery Newport, R. I.

July 1, schedule 3691, steel, corrosion-resisting, sheet, plate and strip; schedule 3697, steel, sheet, tinned and terneplate; schedule 3724, ferromanganese; schedule 3740, tool steel, delivery Philadelphia; schedule 3750, pressure reducing and pressure relief valves.

July 5, schedule 3656, foundry pig iron; schedule 3753, ferrosilicon.

Virginia

ALEXANDRIA, VA.—Virginia Public Service Co., Charlottesville, Va., plans erecting electric power substation, cost of which is estimated at $60,000.

FRONT ROYAL, VA.—H. L. Sizer, president, American Refrigeration Co., Richmond, Va., will construct a $100,000 ice plant.

HILLSVILLE, VA.—Carroll Silk Mill Co., recently organized, care of Thomas J. Wallner, president, Virginia Maid Hosiery Mills Inc., Pulaski, Va., plans installation of electric power equipment in new one-story mill. Cost $200,000.

RICHMOND, VA. — Dixie Container Corp. formed to manufacture corrugated paper containers, has leased about 50,000 square feet of space in buildings former-

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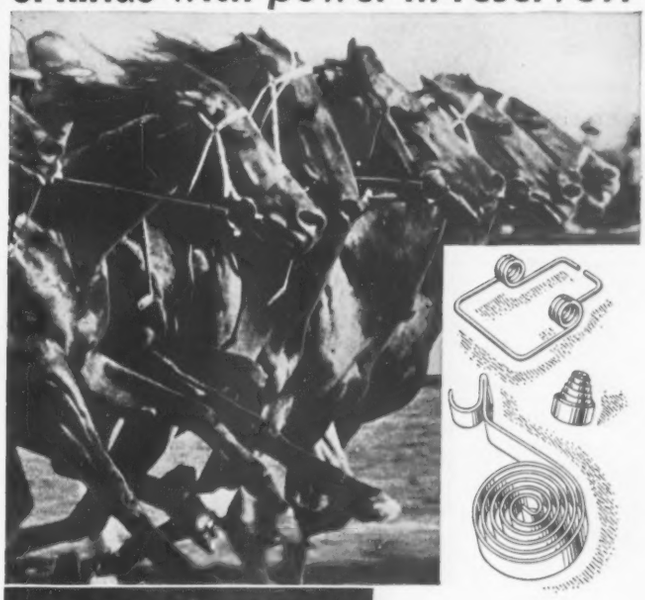

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Missouri

NORTH KANSAS CITY, MO.—Dean Rubber Mfg. Co., Sixteenth and Iron streets, will install electric power equipment in new one-story addition to mill, 75 x 113 feet, at estimated cost of $50,000. Work to begin soon.

ST. LOUIS — American Refrigerator Transit Co., Thirteenth and Olive streets, will soon take bids on general contract for erection of multi-story, four-unit warehouse and distributing building at Barton and First streets. Cost close to $250,000 with conveying, loading and other mechanical handling equipment.

Oklahoma

VINITA, OKLA.—Frigid Ice Co., Bristow, Okla., has plans for new one-story ice manufacturing plant, 60 x 902 feet, costing about $40,000 with equipment. W. F. Wickham is head.

VINITA, OKLA. — Grand River dam authority has postponed closing date of bids from June 3 to June 17 for equipment for new hydroelectric generating plant near Pensacola, Okla., including four 20,000-horsepower and one 750-horsepower hydraulic turbines, with accessories; four 16,000-kva vertical generators and one 625-kva horizontal generator; power dam and power house; radial gates, penstocks, electric hoists, cranes and other equipment. Holway & Neuffer, 2302 East Eighteenth street, Tulsa, Okla., consulting engineers. (Noted May 5).

Wisconsin

BAY CITY, WIS.—Wisconsin Fabricating Co., 401 South Pearl street, will install power equipment in new one-story plant unit for steel fabricating work. Cost $60,000. Foeller, Schober & Berners, 310 Pine street, are architects.

FORT ATKINSON, WIS.—Moe Bros. Mfg. Co., 319 East Clybourn street, Milwaukee, manufacturer of electric fixtures, will install electric power equipment in new one-story plant here at a cost of $75,000. Grasold & Johnson, 734 North Jefferson street, Milwaukee, architects.

MADISON, WIS. — Wisconsin highway commission has revised plans and will take bids soon for highway laboratory and sign and signal fabricating shop, 65 x 148 feet. E. L. Roettiger is state highway engineer.

Minnesota

HENNING, MINN.—Voters approved bond issue of $15,000 and $24,000 certificates of indebtedness to pay city's share of construction of sewage disposal plant and sewers to cost $107,000, with WPA aid. S. A. Aune is village clerk and Druar & Milinowski, 830 Globe building, St. Paul, are consulting engineers.

KEEWATIN, MINN.—Village, John Rebrovich, clerk, is awaiting PWA grant of $26,010 to aid financing construction of municipal heating plant to cost $57,800.

NORTH MANKATO, MINN.—City is awaiting approval of PWA grant of $78,750 to aid financing construction of an electric light plant costing $175,000.

PIPESTONE, MINN. — Southwestern Minnesota Co-operative Electric Co., Clement C. Chase, secretary, is preparing preliminary plans to construct rural transmission lines in Pipestone county to serve about 200 customers. REA funds to be available after July 1. Ellerbe & Co., First National Bank building, St. Paul, is consulting engineer.

TRUMAN, MINN.—Voters approved at election May 23 the construction of a municipal light and power plant to cost $104,000. R. L. Krause is city clerk.

Texas

ABILENE, TEX.—City, R. C. Hoppe, engineer, plans filtration plant improvements, including pipe line, pumping station, etc., to cost $400,000. Hawley, Freese & Nichols, engineers, Capps building, Fort Worth, Tex.

AMARILLO, TEX.—City, Ross D. Rogers, mayor, plans water and sewer improvements; will install fire hydrants, pumping facilities to central pumping plant, additional elevated storage tank. Cost $200,000.

AUSTIN, TEX. — State highway department, has let general contract to Abilene Construction Co., Abilene, Tex., for one-story equipment and repair shop at Abilene, to include forge shop, with storage facilities. Cost over $40,000 with equipment.

GRAHAM, TEX.—City plans filtration plant improvements costing approximately $50,000. Hawley, Freese & Nichols, engineers, Capps building, Fort Worth, Tex.

EL DORADO, TEX.—City has plans and specifications completed for construction of water and sewer system. Koch & Fowler, engineers, Great National Life building, Dallas, Tex.

HOUSTON, TEX. — Thornhill-Craver Co., 3016 Polk street, has let contract to W. A. Burnet, Shell building, for erecting machine shop-office building, one-story, 80 x 120 feet. Cost $20,000.

HOUSTON, TEX.—Phoenix Engineering Co., 2 Rector street, New York, is general contractor for $2,000,000 expansion program of Houston Lighting & Power Co. Work has been started on a $50,000 all-steel building at Eureka Junction transmission line substation; Gables street plant expansion program provides for installation of a 25,000-kilowatt turbine, and a boiler capable of creating 900 degrees temperature and 900-pound pressure will be an auxiliary of the turbine.

Kansas

KANSAS CITY, KANS.—Spring Valley Butter Co., 2532 Penn avenue, Kansas City, Mo., plans installation of electric power equipment in new one-story dairy products plant, 135 x 160 feet. Cost over $80,000. Charles E. Keyser, 609 Minnesota street, Kansas City, Kans., architect.

Nebraska

WEST POINT, NEBR.—City is completing plans for construction of sewage disposal plant approved by WPA. J. Reynolds, 519 South Fifty-first avenue, Omaha, Nebr., consulting engineer.

Iowa

BELMOND, IOWA—City, Carrie Courtney, city clerk, will hold an election June 20 to vote on construction of an electric light plant to cost $120,000.

CENTERVILLE, IOWA—City, Edmund Hanson, city clerk, is considering purchase of waterworks plant which, if purchased, will require improvements costing $88,500.

COON RAPIDS, IOWA — Board of trustees, C. D. Charles, secretary, is taking bids to June 27, 2 p.m., on a 575 to 725-horsepower diesel engine. A. S. Harrington, 501 Baum building, Omaha, Nebr., is consulting engineer.

DES MOINES, IOWA—WPA has allotted $256,338 for laying 10 miles of water mains and improvements of waterworks plant equipment to cost $400,000. Rex Ramsay is city clerk.

FORT DODGE, IOWA—Tobin Packing Co. plans installation of power equipment in new addition to meat packing plant, on which work will begin soon. Cost about $100,000. (Noted June 6.)

STEAMBOAT ROCK, IOWA—City, Enno Luiken, city clerk, has engaged Ralph B. Slippy, Lafayette building, Waterloo, Iowa, as consulting engineer to prepare plans for construction of a waterworks system, sewers and sewage disposal plant.

TRIPOLI, IOWA—City council, A. W. Buechele, city clerk, is considering plans for construction of a waterworks plant.

WATERLOO, IOWA—John Deere Tractor Co., Miles street, plans installation of electric power equipment in new three-story and basement addition to tractor manufacturing plant. Work scheduled to begin soon.

Pacific Coast

LOS ANGELES—Pacific Pump Works, 5517 Bickett street, Huntington Park, Calif., is erecting an addition to its factory, 60 x 60 feet.

LOS ANGELES—Bergstrom Steel Co. has been granted building permit for construction of a reinforced concrete office building and warehouse of steel frame construction at Slauson and Magnolia avenues, at a cost of $39,000.

OLEUM, CALIF.—Permission to erect a $5,000,000 steam and electric generating plant, adjacent to Union Oil Co.'s refinery, recently completed here, has been granted by the California Railroad Commission to the Pacific Gas & Electric Co.

UPLAND, CALIF.—Old Baldy Citrus association, East Nineteenth street, plans installation of power equipment in new one-story addition to fruit packing plant. Work will begin soon. Cost estimated at $80,000. W. W. Ache, 301 North Citrus avenue, Los Angeles, architect.

VERNON, CALIF. — Swift & Co., Union Stock Yards, Chicago, plans installation of electric power equipment in new four-story meat packing plant here, including improvements in present branch plant in Vernon. Cost estimated at $1,000,000. Work scheduled to start soon.

ANACORTES, WASH.—Anacortes Plywood Co., J. J. Lucas, is building a plywood mill and will purchase power equipment. Fund of $400,000 has been arranged.

BREMERTON, WASH. — Bureau of yards and docks, navy department, is preparing plans for extensions and improvements in power plant at Puget Sound navy yard, estimated to cost $450,000 with equipment, and for extensions and modifications in electrical distributing system at same yard. Appropriation is being arranged through supplemental naval budget for fiscal year 1938-39.

SEATTLE—University of Washington regents are considering bids totaling $150,000 for addition to boiler house and equipment, including structure, piping and conveyor system.

SEATTLE — Moline Elevator Co., 113 Madison street, maker of elevators and parts, has leased one-story machine shop, 30 x 108 feet, to be erected by Charles Clise, Securities building. Cost close to $45,000 with machinery. Bids have been asked on general contract.